



2015 Annual Report

JIS Landfill Site
South Brunswick, New Jersey

JIS Landfill Site Performing Parties Group

Table of Contents

1.	Introduction.....	1
1.1	Groundwater Monitoring Program Changes	1
2.	Routine Activities Performed in the Reporting Period.....	3
2.1	Biosparge Groundwater Monitoring Program	3
2.2	Annual Groundwater Monitoring Program	5
2.3	Soil Vapor Intrusion Assessment.....	7
2.3.1	Groundwater Sampling.....	7
2.3.2	Vadose Zone Well Sampling	8
2.3.3	Indoor Air / Sub-Slab Vapor Assessment 2015.....	8
2.4	Site Maintenance	9
2.5	Reporting.....	9
3.	Additional Activities Performed in Reporting Period	9
3.1	Classification Exception Area	9
4.	Work Scheduled for the Next Reporting Period	10

Figure Index

Figure 1	Biosparge Results - VOCs
Figure 2	Biosparge Results - Benzene
Figure 3	Biosparge Results - Chlorobenzene
Figure 4	Biosparge Results - 1,4-Dichlorobenzene
Figure 5	Biosparge Results – Xylene
Figure 6	Biosparge Results – 1,2,4-Trichlorobenzene
Figure 7	Biosparge Results - Manganese
Figure 8	Biosparge Results – Dissolved Oxygen
Figure 9	2015 Exceedances of New Jersey Groundwater Quality Standards – Most Recent Groundwater Samples
Figure 10	2015 Exceedances of New Jersey Groundwater Quality Standards – Most Recent Shallow Groundwater Samples
Figure 11	2015 Exceedances of New Jersey Groundwater Quality Standards – Most Recent Intermediate Groundwater Samples
Figure 12	2015 Exceedances of New Jersey Groundwater Quality Standards – Most Recent Deep Groundwater Samples
Figure 13	2014 Exceedances of New Jersey Vapor Intrusion Groundwater Screening Levels – Most Recent Shallow Groundwater Samples
Figure 14	2015 Exceedances of New Jersey Vapor Intrusion Groundwater Screening Levels – Most Recent Shallow Groundwater Samples

- Figure 15 Biosparge Monitoring – Vadose Zone Well Locations
- Figure 16 2015 CEA Areal Extent Shown on Tax Maps
- Figure 17 Monitoring Well Modifications

Table Index

- Table 1 Groundwater Analytical Results – NJGWQS Comparison
- Table 2 Dissolved Oxygen Concentrations
- Table 3 Shallow Groundwater Analytical Results – NJGWSL Comparison
- Table 4 Vadose Zone Field Sampling Results
- Table 5 2015 Indoor / Outdoor Air Analytical Results

Appendices

- Appendix A Photographs of Grass Fire Area

1. Introduction

On behalf of the JIS Landfill Site Performing Parties Group (JIS Group), GHD (formerly known as Conestoga-Rovers & Associates) is submitting this annual progress report for the period January 2015 through December 2015 for the JIS Landfill Site (Site). The last report was submitted in January 2015. This annual report includes all sampling and monitoring activities completed since the last report, including those associated with the vapor intrusion assessments as well as all other components that were previously reported.

The Remedial Design/Remedial Action activities at the JIS Site were completed pursuant to Administrative Consent Orders (ACO) entered into in 1997 and in 2004 by the JIS Group and the NJDEP. All of the work associated with these ACOs is now complete.

An Administrative Order (AO) covering future work to be performed at the JIS Site was issued by the USEPA to the JIS Group on September 3, 2010. This AO includes implementation/monitoring of the biosparge system and other remedial components for the Site as described in the Record of Decision (ROD), ROD Amendment, and the approved Remedial Action Work Plan. This annual progress report is being prepared pursuant to Section 13.0 of the Remedial Action Work Plan.

1.1 Groundwater Monitoring Program Changes

In 2015, the following program changes were implemented to expand the monitoring network for the biosparge injection system:

- The installation of three new sentry wells located approximately 100 feet upgradient of the injection system.
- The conversion of the two large diameter pumping wells (PW-1 and PW-2) each into two specific wells monitoring different zones within the aquifer.

The three new sentry wells (MW-68, MW-69, and MW-70) each consist of three separate wells; one monitoring the shallow, intermediate, and deep zones of the aquifer at each location. These wells were intended to straddle the path of the known central axis of the plume emanating from the landfill as previously defined by wells MW-5 and MP-6. The locations of the wells are shown on Figure 9. The groundwater samples collected from these wells confirm that the primary flow path of the plume follows from the shallow well at MW-5, through the shallow zone at the location of MW-69 and the intermediate zone at MW-70 and then continues downgradient toward MP-6. As previously approved by the USEPA, these three new well nests will be sampled semi-annually for two years to provide insight into the concentration of chemicals approaching the biosparge injection system. The analytical data for the samples collected from these three new sentry wells and converted wells PW-1 and PW-2 are included in Table 1 and presented and discussed with the Biosparge Groundwater Monitoring program.

Consistent with recommendations set forth in the 2012 / 2013 Annual Report, samples were also collected from wells MW 21I & D and MW 61D in 2015 to monitor water quality in these areas.

The data from these additional wells were used to determine the extent of chemical presence to recertify the Classification Exception Area in 2015.

Additional Work Performed in 2015

Based on the analytical data collected in recent years, the JIS Group prepared a Work Plan proposing some modifications to the groundwater monitoring program in 2014 (August 5 and September 16). The USEPA approved the Work Plan on October 30. To the extent possible, the modifications were completed in 2015. The modifications are illustrated on Figure 17 and summarized as follows:

- Closure of the following 50 wells:

- MW-1 S&D	MW-6 S&D	MW-9
- MW-14 S&D	MW-19 S&I	MW-24 S,I&D
- MW-26 S,I&D	MW-28 S,I&D	MW-29
- MW-33 S,I&D	MW-35	MW-36
- MW-39 S	MW-40 S&D	MW-53 S, I&D
- MW-56 S,I-1,I-2&D	MW-62 S&D	MW-64 S&D
- MP-1	MP-2	MP-3
- MP-4	RT-3	B-3
- B-4	PZ-1	PZ-2
- PZ-3	PZ-4	OIW-5D
- Wells B-3, B-4, PZ-1, PZ-2, PZ-3, and PZ-4 were not listed for closure in the original Work Plan but were encountered during the field work for the closure of the listed wells. These wells were installed in 2000 as part of the pump & treat remedy evaluation and no longer serve any function and therefore were closed. Similarly wells MP-1, MP-2, MP-3, MP-4, and OIW-5D were initially installed as part of the biosparge pilot study but are no longer in use. Therefore, they were also closed. It was planned to close wells MW-37, MW-38, and MW-39 D but these three wells could not be located in the field and therefore were not closed.
- Installation of a replacement well nest at the location of MW-53. The existing wells at MW-53 had blockages that prevented monitoring devices from being installed into the wells. So the original wells were closed and a replacement set was installed.
- Three well nests are still scheduled for possible relocation. Wells MW-22, MW-23, and MW-34 will be moved if the property owner's final plan for development of the property poses a conflict with the current location of these three well nests. The wells will be moved just prior to the development's implementation.

2. Routine Activities Performed in the Reporting Period

2.1 Biosparge Groundwater Monitoring Program

Overview

The biosparge groundwater monitoring program consists of the collection and analysis of groundwater samples from 45 monitoring wells (MW-42 through MW-55 and MP-6) that were installed along the alignment of the biosparge system. The wells are grouped into 15 well nests with each well nest including a shallow, intermediate, and deep screened interval. The wells in the core of the JIS plume (located between wells MW-53 and MP-6) are now sampled semi-annually (EPA approved semi-annual monitoring on October 30, 2014), whereas the remainder of the wells in the biosparge monitoring network are sampled annually. The samples from the wells that are on the annual cycle are collected in March / April of each year to coincide with the annual sampling event for the plume monitoring program. The most recent biosparge sampling events were conducted on the following dates:

- October 15 – 17, 2014
- January 13 – 14, 2015
- March 25 - 31, 2015
- May 21 - 22, 2015
- October 6 – 9, 2015 (start of semi-annual monitoring)

All of the wells in the biosparge monitoring program are sampled for VOCs (including 1,4-dichlorobenzene and 1,2,4-trichlorobenzene), arsenic, and manganese.

A groundwater sample is also collected from well MW-5 as part of the biosparge monitoring program. This well is located immediately downgradient of the landfill and upgradient of the biosparge system, and it provides an indication of the groundwater quality emanating from the landfill. Samples from the newly installed sentry wells and the converted PW wells were also collected in 2015.

The biosparge monitoring program focuses on tracking the oxygen and VOC concentrations in the groundwater. The most prominent VOCs are:

- Benzene
- Chlorobenzene
- 1,4-dichlorobenzene
- Xylenes (total)
- 1,2,4-trichlorobenzene

Manganese is also a primary compound of concern although it is a naturally occurring compound and is not a compound that poses a health-related risk. Plots of the chemical concentration trends for these compounds are presented in Figures 1 through 7.

The analytical results from the biosparge monitoring program for this reporting period are presented in Table 1. The 2015 data are mostly consistent with results from previous years and are summarized as follows:

Groundwater Flow

Groundwater at the JIS Landfill flows easterly. The contaminant plume is limited to a relatively narrow band emanating in the area of MW- 5 and moving downgradient between on-Site wells MW-53 and MP-6 (as shown in Figure 9). The installation of the new sentry wells has further refined the location of the main core of the plume as passing through the shallow and intermediate zones of the aquifer at wells MW-69 and MW-70 on its path between MW-5 and MP-6. The biosparge injection system is located immediately downgradient of MW-53 and MP-6 and provides treatment of the groundwater prior to and beyond the downgradient property boundary. This system has been successful in treating and mitigating further contaminant migration beyond the eastern property boundary.

VOC Trends

Well MW-5, located closest to the landfill in the primary core area, continued to have total VOC concentrations ranging between 6,000 and 35,000 parts per billion (ppb) in 2015. Monitoring wells MW-69 S and MP-6 S, which are located 200 and 300 feet downgradient of MW-5 respectively, best reflect conditions along the primary plume axis downgradient of MW-5 and upgradient of the treatment zone. Total VOC concentrations at MW-69 S and MP-6 S exhibit significant reductions when compared spatially to MW-5. The concentrations ranged from 6,900 to 8,500 ppb at MW-69 S and from 400 to 800 ppb at MP-6 S in 2015. Monitoring well MW-50 is the next downgradient well along the plume axis from MP-6 and is located within a line of off-property monitoring wells transecting the general plume area approximately 100 feet downgradient from the biosparge injection system. Total VOC levels are significantly reduced along this line and, with the exception of benzene in the shallow zone at well MW-49 and in the intermediate zone at well MW-50 and TCE in the intermediate zone at well MW-49 and the deep zone at well MW-50; all of the prominent VOCs were below the respective groundwater criterion in this downgradient area during the most recent monitoring event.

The first two sets of groundwater samples collected from the new sentry wells showed that the overall Total VOC concentrations approaching the biosparge system are currently decreasing. For example, the Total VOC concentrations in MW-69 S decreased from 8,500 ppb in May 2015 to 6,900 ppb in October 2015. Similarly, the total VOC concentration at MW-70 I decreased from 1,700 ppb in May 2015 to 400 ppb in October 2015.

While TCE has been present in a few of the biosparge monitoring wells over the past 10 years, the concentration of TCE in the on-site monitoring wells has historically never exceeded 5 ppb. In October 2015, however, TCE was identified to be present in three wells at concentrations that exceed 5 ppb. The observed concentrations were:

MW-5	43 ppb
MP-6 D	160 ppb
MW-69 I	210 ppb (this is a newly installed well sampled for the first time in 2015)

In October 2015, TCE was detected in well MW-5 (located closest to the landfill) at a concentration of 43 ppb and was present at well MW-69 I (a new sentry well located hydraulically downgradient

from MW-5) at a concentration of 210 ppb. The New Jersey Groundwater Quality Standard (NJGWQS) for TCE is 1 ppb. The recent detection of TCE at well MW-5 and its subsequent detection in downgradient monitoring wells may be a temporal occurrence and it is planned to continue to monitor these conditions in 2016 to better understand potential VOC trends.

Dissolved Oxygen Trends

The dissolved oxygen concentrations in the biosparge monitoring wells are presented in Figure 8 and on Table 2. The series of 120 injection wells that are used to deliver the compressed air into the aquifer from the compressor / control building is also shown on Figure 8. The oxygen concentrations measured in the most recent 2015 sampling event from the 45 groundwater monitoring wells that make up the biosparge monitoring well network fall into the following categories:

<0.2 ppm	(oxygen deficient)	1 well	(5)
> 0.2 ppm but < 2 ppm	(may be limiting the biodegradation)	2 wells	(3)
> 2 ppm but < 5 ppm	(adequate to support biodegradation)	2 wells	(3)
> 5 ppm	(ideal for biodegradation)	40 wells	(32)

For comparison, the number of wells in each category in 2014 is presented in parentheses. As can be seen from these data, the oxygen levels in the wells with historically lower oxygen concentrations have increased in 2015 compared to 2014 resulting in an improved distribution of the oxygen. There is only one well (MP-6 I) in which the oxygen level remains low. This well is located upgradient of the injection system and within the general flow path of higher chemical concentrations and therefore is more likely to have low oxygen concentrations.

As expected, the oxygen levels in the new sentry wells were mostly 0 ppm and all were less than 1 ppm.

Maintenance

In the 2014 Annual Report, it was stated that an acid wash of some injection wells was planned for 2015 to rehabilitate those wells where the air injection capacity has diminished. This rehabilitation was successfully performed in May on eight injection wells (A-4S, A-5S, A-6S, A-7S, A-8S, A-19I, A-23D, and A-29D). All of these wells now have improved air injection capacity.

Recommendations for 2016 operations include continued monitoring of the oxygen distribution pattern to maintain the oxygen levels along the injection boundary. Appropriate maintenance or adjustments to the injection pattern will be made as needed to optimize the distribution of oxygen.

2.2 Annual Groundwater Monitoring Program

The second monitoring program at the Site is the annual groundwater monitoring program. In 2015, the annual monitoring program consisted of the collection and analysis of groundwater samples from 22 wells in the JIS plume downgradient of the Site. The majority of these wells are within the JIS plume with the remainder being located just outside the plume which helps to delineate the extent of the plume. The tracking of the location of the plume and the concentrations of the chemicals within the plume are the primary purposes of the annual groundwater monitoring program. The annual sampling event is typically conducted in March / April every year since this is the time of year that it is easiest to access the wells and there is minimal interference with crops.

This program is conducted jointly with one of the biosparge system monitoring events to collect contemporaneous data on the complete set of Site monitoring wells. In 2015, the annual sampling event was performed between March 25 and March 31.

The groundwater samples collected for the annual plume program are analyzed for VOCs (including 1,4-dichlorobenzene and 1,2,4-trichlorobenzene), arsenic, and manganese. The analytical results from the 2015 annual sampling program are included in Table 1. The 2015 data are consistent with results from previous years and are summarized as follows:

- As the JIS plume migrates downgradient along its easterly flow path, it also migrates vertically toward the bottom of the aquifer which is on the order of 100 feet below the ground surface. The historical groundwater data have shown that by the time the plume has migrated 2,000 feet downgradient of the Site, what remains of the core of the plume has reached the deep portion of the aquifer, where it continues to attenuate.
- The groundwater quality within the JIS plume area continues to improve.
- The improvement is occurring along the entire length of the plume.
- The mitigation of off-site migration and treatment of the JIS plume that has occurred due to the operation of the biosparge system has bisected the plume, with one part remaining beneath the landfill and the other attenuating downgradient plume segment now being separated from the on-Site plume by a distance of approximately 1,400 feet. This separation is the treated water zone that has been created by the biosparge system and natural attenuation. The plume continues to move with the groundwater flow regime which is estimated to migrate at a rate of about 1 foot per day. The oxygen enriched groundwater that was created by the biosparge system also continues to move at a rate of about 1 foot per day, thus extending the length of the treatment zone as it continues to migrate. Figure 9 shows the overall extent of the plume as defined by the 2015 annual sampling event. Figures 10, 11, and 12 show the extent of the plume in the individual layers of the aquifer as defined by the shallow, intermediate, and deep portions of the plume.
- The following summarizes the chemical conditions illustrated by the figures:
 - **Shallow** - The only off-site exceedances of the NJGWQS downgradient of the Site are wells located 100 feet from the Site boundary and four slight exceedances (for benzene, 1,2-dichloropropane, 1,2,4-trichlorobenzene, and 1,4-dichlorobenzene) at well MW-7 S which is located 300 feet east of the JIS Site boundary.
 - **Intermediate** – In the intermediate zone, the size of the plume is the same as it was in 2014. The only exceedances in the intermediate wells are for TCE (3 ppb) at well MW-22, a historic exceedance at MW-63 for PCE (in the most recent sample round collected from this well in 2010), and at well MW-21 where TCE has historically always been present. The current concentration at MW-21 is only 6 ppb compared to historic concentrations as high as 45 ppb. Benzene has recently also been observed at this well, although the concentration is only 1.5 ppb. The highest total VOC concentration in the intermediate zone in the downgradient plume area (i.e. beyond the wells located 100 feet downgradient of the injection system) is now only 9 ppb (at well MW-21).
 - **Deep** – In the deep zone, the downgradient plume area extends from well MW-23 to MW-60. The highest benzene concentration is 8 ppb at MW-60. The easternmost extent or downgradient limit of the plume is located in the vicinity of well MW-60. Historically, Well MW-25 had defined the easternmost extent of the plume but the benzene concentrations at

this well have decreased from 2,100 ppb in 2000, to less than 1,000 in 2004, to less than 100 in 2007, and have been below the NJGWQS of 1 ppb since 2012. The benzene concentration at well MW-60 has decreased from 47 ppb in 2007 to 8 ppb in 2015. Expectations are that the concentration of benzene in MW-60 will meet the NJGWQS within the next few years. Monitoring well MW-23 represents the westernmost fringe of the downgradient plume area. In 2014, there were no exceedances of any NJGWQS at MW-23. However, in 2015, benzene was again detected in the deep zone at 1.4 ppb; which is slightly above the NJGWQS of 1 ppb.

2.3 Soil Vapor Intrusion Assessment

In accordance with the USEPA approved "Vapor Intrusion Sampling Plan" (CRA - August 2011), an annual assessment of the potential for soil vapor intrusion is performed at and around the JIS Landfill. The annual assessment uses the shallow groundwater data from monitoring wells included in the following groundwater monitoring programs to complete the assessment:

- The annual groundwater monitoring program which covers the entire JIS Plume downgradient of the JIS Site.
- The groundwater monitoring that is performed to assess the effectiveness of the biosparge injection system.
- A supplemental investigation of vapor intrusion potential that was conducted in the vicinity of the southeast corner of the JIS Site including additional sampling of wells MW-66S and MW-67S near the southeast corner of the JIS Site.

The data from these shallow wells are compared to the New Jersey Groundwater Screening Levels (NJGWSLs) to determine whether there are any exceedances, and if so, what buildings are in the vicinity of the exceedances that would warrant further consideration for assessment or investigation. The assessment takes into consideration land use changes that occur from time to time that may have a bearing on where specific investigations become necessary.

Based upon the results of the 2014 sampling programs, the 2015 assessment included follow up investigation at the following buildings:

- Sampling of the indoor and outdoor air within and near the JIS building.
- It was planned to sample the sub-slab conditions at the residence/auto body shop located at the intersection of Cranbury South River Road and Docks Corner Road. However, access was not granted.

The results of the sampling that was performed in 2015 are presented in the following sections.

2.3.1 Groundwater Sampling

The groundwater samples collected from all of the shallow groundwater monitoring wells included in the biosparge and annual monitoring programs in 2015 have been compared to the NJGWSLs and are presented in Table 3. Figure 14 presents the 2015 groundwater data on a map of the area. As can be seen by comparing the 2015 groundwater data (Figure 14) with the 2014 data (Figure 13), the results are similar. The only exceedances of NJGWSLs in 2015 occurred on the JIS property and at well MW-7S which is located about 200 feet from the Site boundary. The only compound that exceeded the screening level at MW-7S was 1,4-dichlorobenzene. The concentration of

1,4-dichlorobenzene was 76 ppb compared to the screening level of 75 ppb. These are the only areas of potential vapor intrusion concern (see Figure 14).

The 2015 groundwater results from wells MW-66S and MW-67S near the southeast corner of the JIS Site show that there are no exceedances of the NJGWSLs in these wells (see Table 2). Given that the data from the past two years show no exceedance of the NJGWSLs, no further sampling of these wells is planned.

Based upon these data, the vapor intrusion sampling for the upcoming 2015/2016 heating season will include the following:

- Sampling of the indoor and outdoor air within and near the JIS building (It is planned to include this sampling of the JIS building in each annual event, unless the building is demolished or no longer occupied or the groundwater quality meets the NJGWSLs).
- Sub-slab and outdoor air samples from beneath and near the residence/auto body shop located at the intersection of Cranbury South River Road and Docks Corner Road. A new request for access will be made to the owner of the property to address the historic presence of VOCs near this building.

Based upon the current land use, these are the only two buildings in the vicinity of a NJGWSL exceedance and therefore the only two buildings included in the planned sampling program for the coming heating season.

2.3.2 Vadose Zone Well Sampling

In accordance with the Remedial Action Work Plan, the vadose zone wells that were installed to monitor the soil gas quality around the biosparging injection system continue to be sampled semi-annually. The sampling program involves the use of hand held equipment to monitor the vadose zone in the seven on-Site vadose zone monitoring wells, as shown on Figure 15.

The results of the vadose zone sampling of the biosparging monitoring wells performed in 2015 are presented in Table 4. The results are consistent with the previous years' data. All of the photoionization sample results are 0 ppm. Consistent with the Remedial Action Work Plan, no summa canister samples were collected in 2015 since the vapor readings in the wells were at or near background levels.

2.3.3 Indoor Air / Sub-Slab Vapor Assessment 2015

The long-term monitoring program for the JIS Site includes an indoor air quality assessment component. On February 27, 2015, CRA collected an indoor air sample from within the JIS building. A sample of the outdoor air adjacent to the JIS building was also collected and analyzed. The analytical results for these samples are presented in Table 5. A comparison to the applicable NJDEP air quality criteria is also provided. It is noted that none of the detected chemicals in the indoor air sample exceeds the New Jersey Rapid Action Levels and no compounds exceeded the NJDEP non-residential indoor air criteria. As was experienced with previous sampling events, some compounds were detected in the indoor air within the JIS building. Most of the detected compounds (1,2,4-trimethylbenzene, benzene, toluene, and xylene) are found in petroleum-based products. Given that the office is attached to the Jones' machine and repair shop, it is not unexpected that vapors from such petroleum-based chemicals would be present in the indoor air of the office.

It was also planned to collect a sub-slab vapor sample from the residence / auto body shop located to the southeast of the intersection of Cranbury South River Road and Docks Corner Road. However, access permission to perform this sampling was not provided by the owner of the property. Consequently, the planned sub-slab sampling was not performed. A request will be made for access to collect these samples during the 2015/2016 winter heating season.

2.4 Site Maintenance

The routine Site inspections conducted over the past year have not identified any items requiring special attention. All systems are operating / performing normally as follows:

- The air injection system operated as designed. The compressor received normal maintenance. Eight air injection wells were rehabilitated in 2015 using an acid wash method.
- The Site cap is in good condition. There were no signs of erosion and the vegetative cover is healthy. The vegetation was cut twice; once in May and again in October.
- Some woody vegetation that had grown on the north slope of the Site was removed.
- The Site security is in good condition. The fence is regularly checked.

There was one non-routine event that occurred at the Site in 2015. On September 3, a grass fire occurred on the neighboring property (965 Cranbury South River Road) to the north of the JIS Site. The fire spread onto the JIS property and scorched some of the grass on the Site. In addition, one of the gas vapor vents on the Site toppled over. The local fire department was called and put out the fire. The vegetation is re-establishing itself and the vent has been repaired. Photographs of the area are presented in Appendix A.

2.5 Reporting

The JIS Group submitted the 2014 Annual Report to the USEPA on January 14, 2015. That report covered the period October 2013 through September 2014. It is planned to submit these annual reports in December/January each year in conjunction with the JIS Group's preparations for the annual vapor intrusion investigations.

3. Additional Activities Performed in Reporting Period

3.1 Classification Exception Area

In 2011, the JIS Group submitted a report to the NJDEP providing information on the location of the JIS plume downgradient of the Site and a list of the private properties upon which the plume is located. (The list also included private properties upon which groundwater exceeds a NJGWQS, regardless of the location from which the chemicals may have been sourced.) This documentation was accepted by the NJDEP and on May 6, 2013, the NJDEP issued a letter approving the Classification Exception Area (CEA) as defined in the report. In August 2013, the JIS Group sent registered letters to the property owners, municipalities, and county health departments included in the CEA. On May 6, 2015, the JIS Group submitted the first biennial recertification of the CEA to the NJDEP using the groundwater data collected in March 2015. Registered letters to the property owners, municipalities, and county health departments will be sent out upon receipt of approval of

the CEA delineation by the NJDEP. The next biennial recertification of the CEA will be due in May 2017 and will be based upon data collected early in 2017. It is noted that the groundwater concentrations in the plume continue to decrease, and therefore, the JIS Group anticipates that the area included in the CEA will also decrease over time. Therefore, the JIS Group also anticipates that the number of properties that will be included in the next iteration of the CEA will also decrease. Figure 16 shows the limits of the CEA based on the most recent 2015 groundwater data.

4. Work Scheduled for the Next Reporting Period

In the next reporting period (2016), the work to be performed will be compliant with that specified in the Remedial Action Work Plan. The following work is scheduled for the next reporting period:

- Continue to operate and maintain the biosparge treatment system.
- Continue to perform the biosparge groundwater monitoring program and the annual plume groundwater monitoring program.
- Perform the soil vapor intrusion sampling during the winter months, including access requests.
- The annual report on the year's activities will be prepared and submitted in December 2016 / January 2017.
- Continue to work with the various property owners around the JIS Site on an as-needed basis.

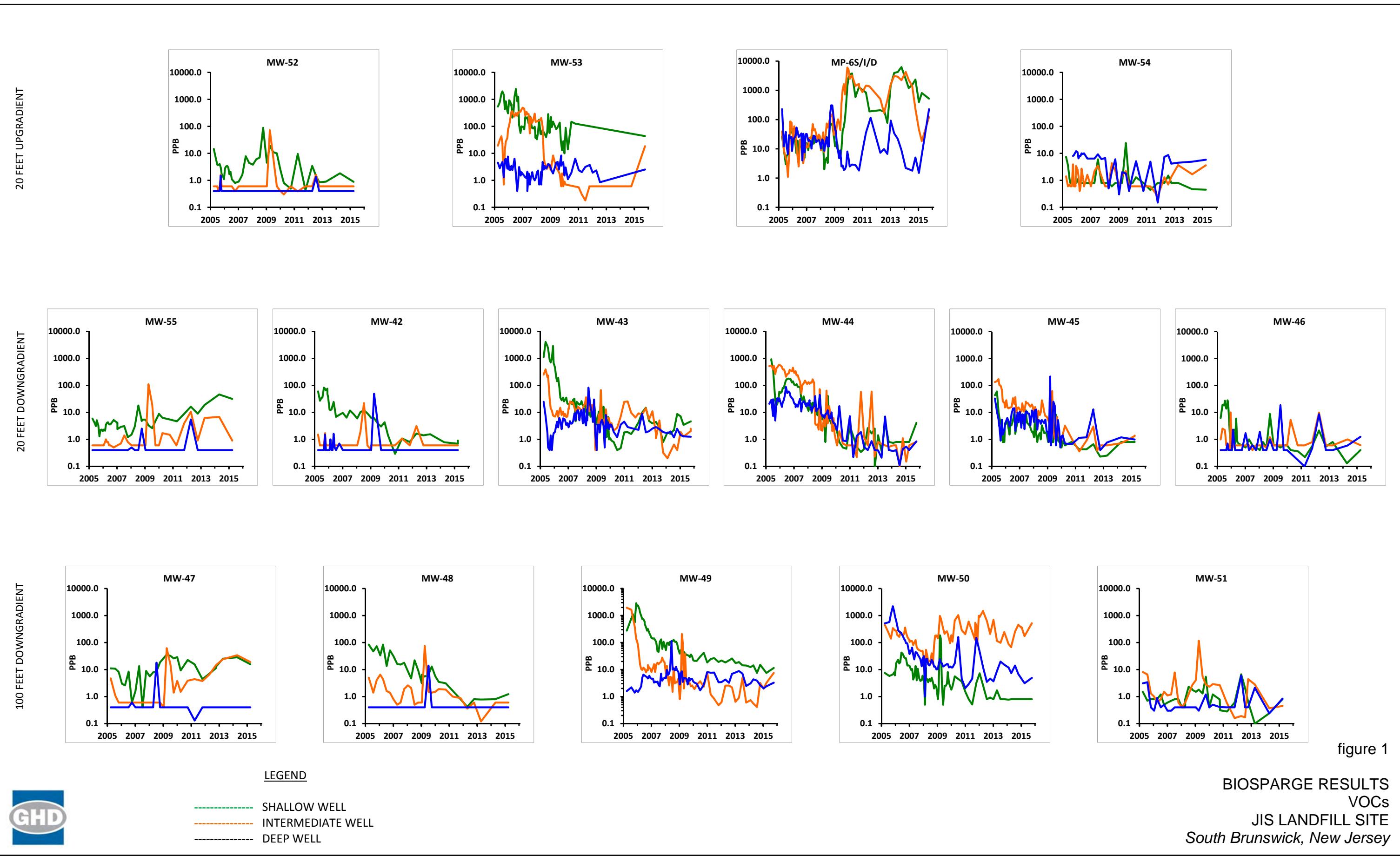
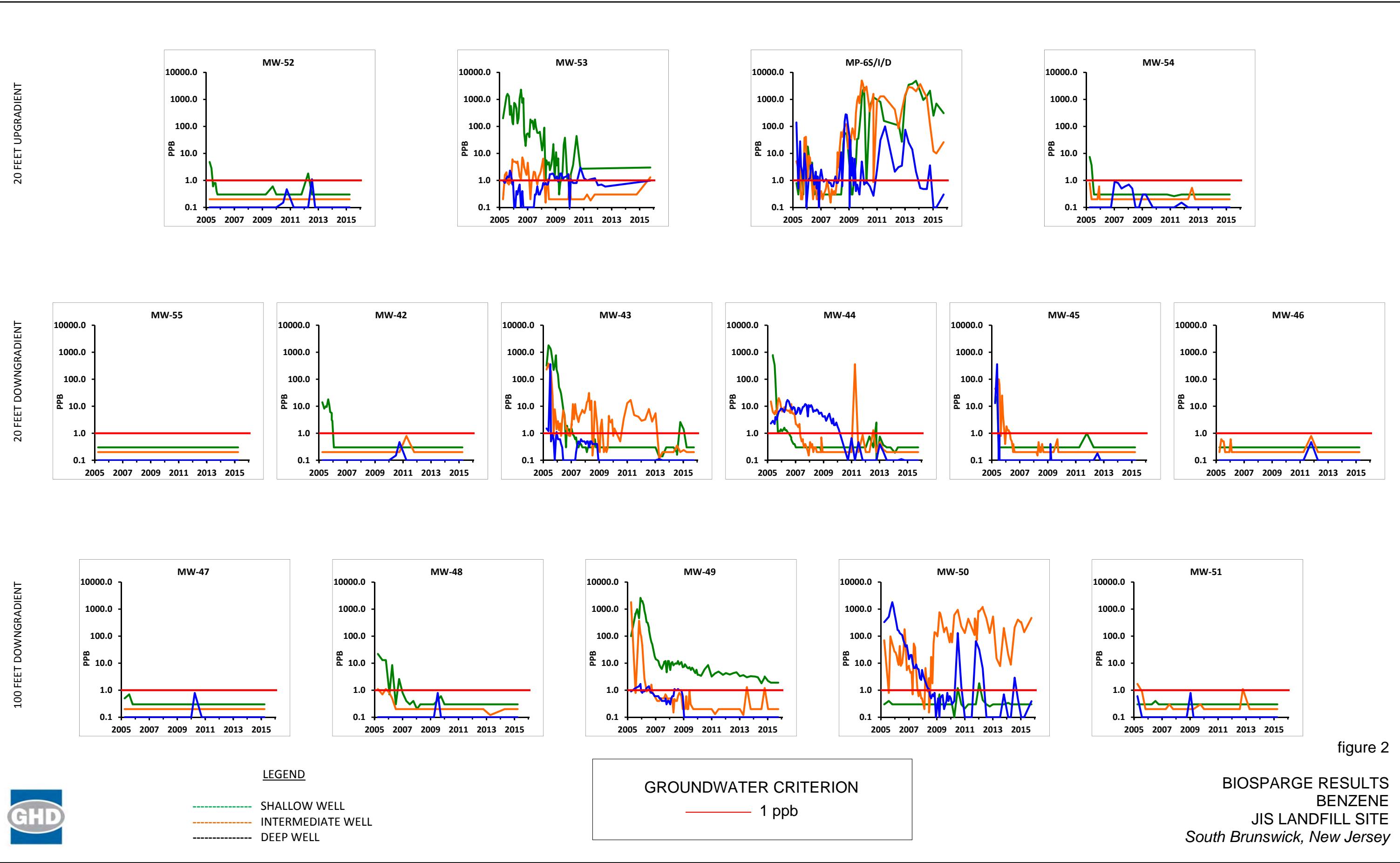


figure 1



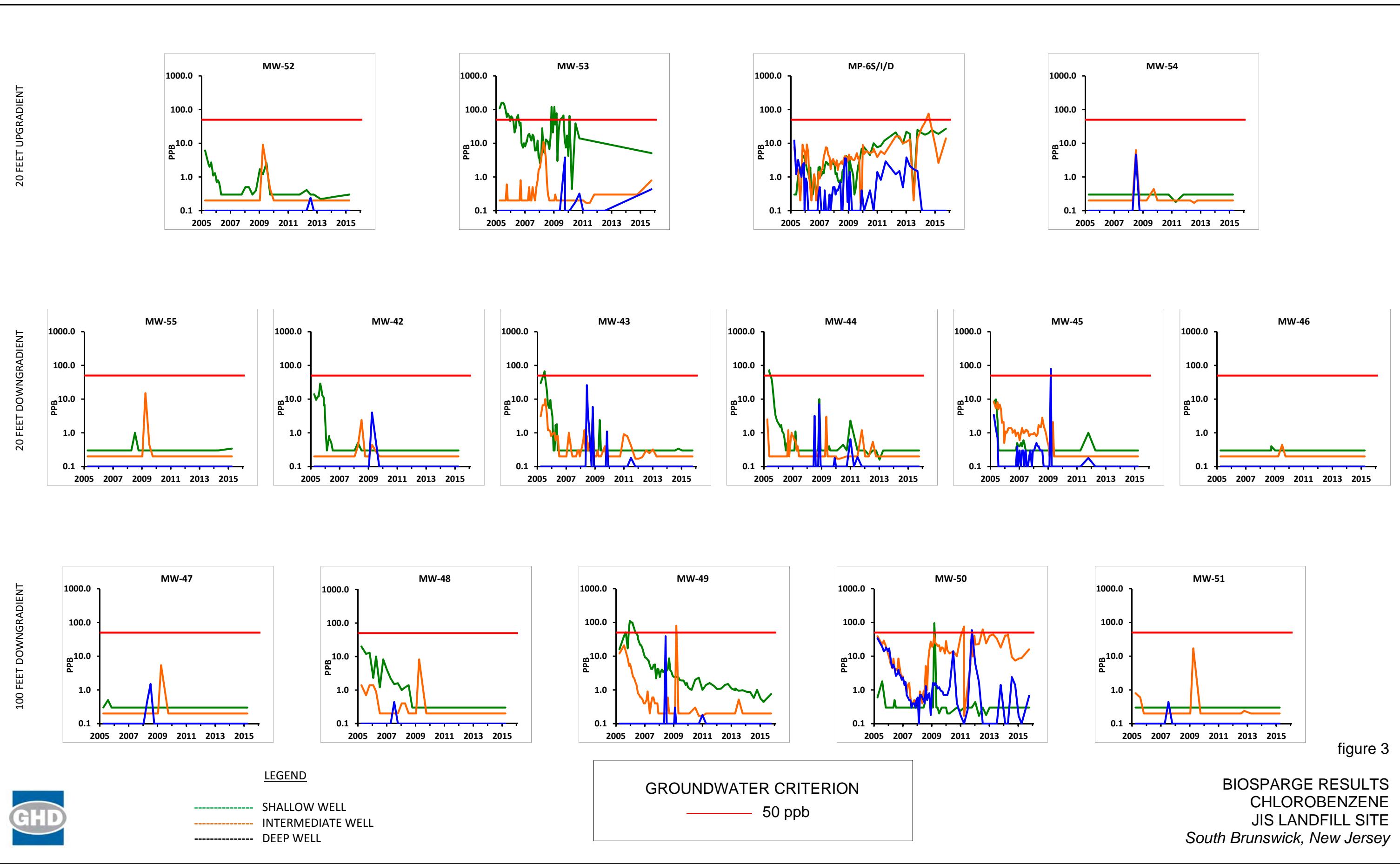
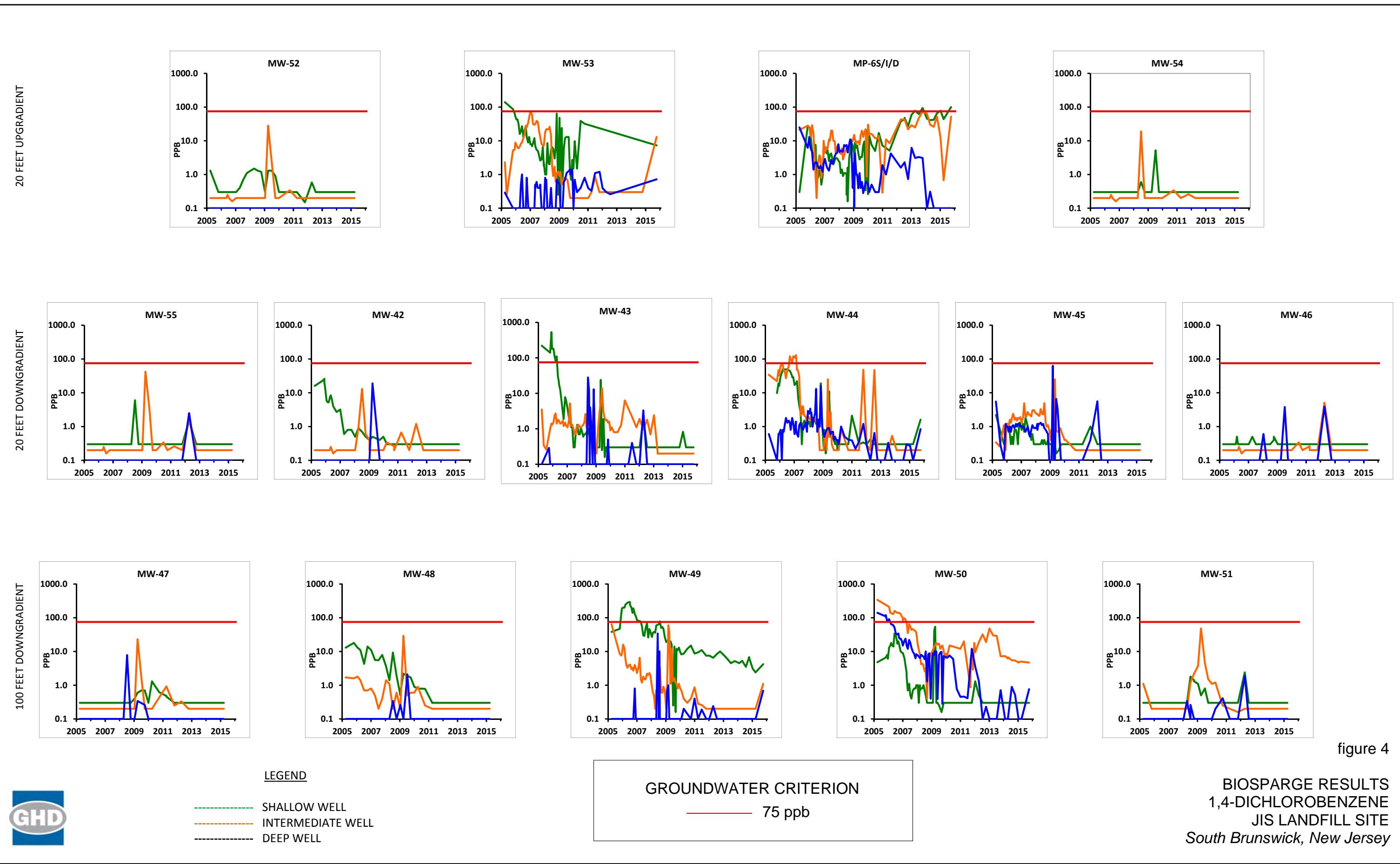
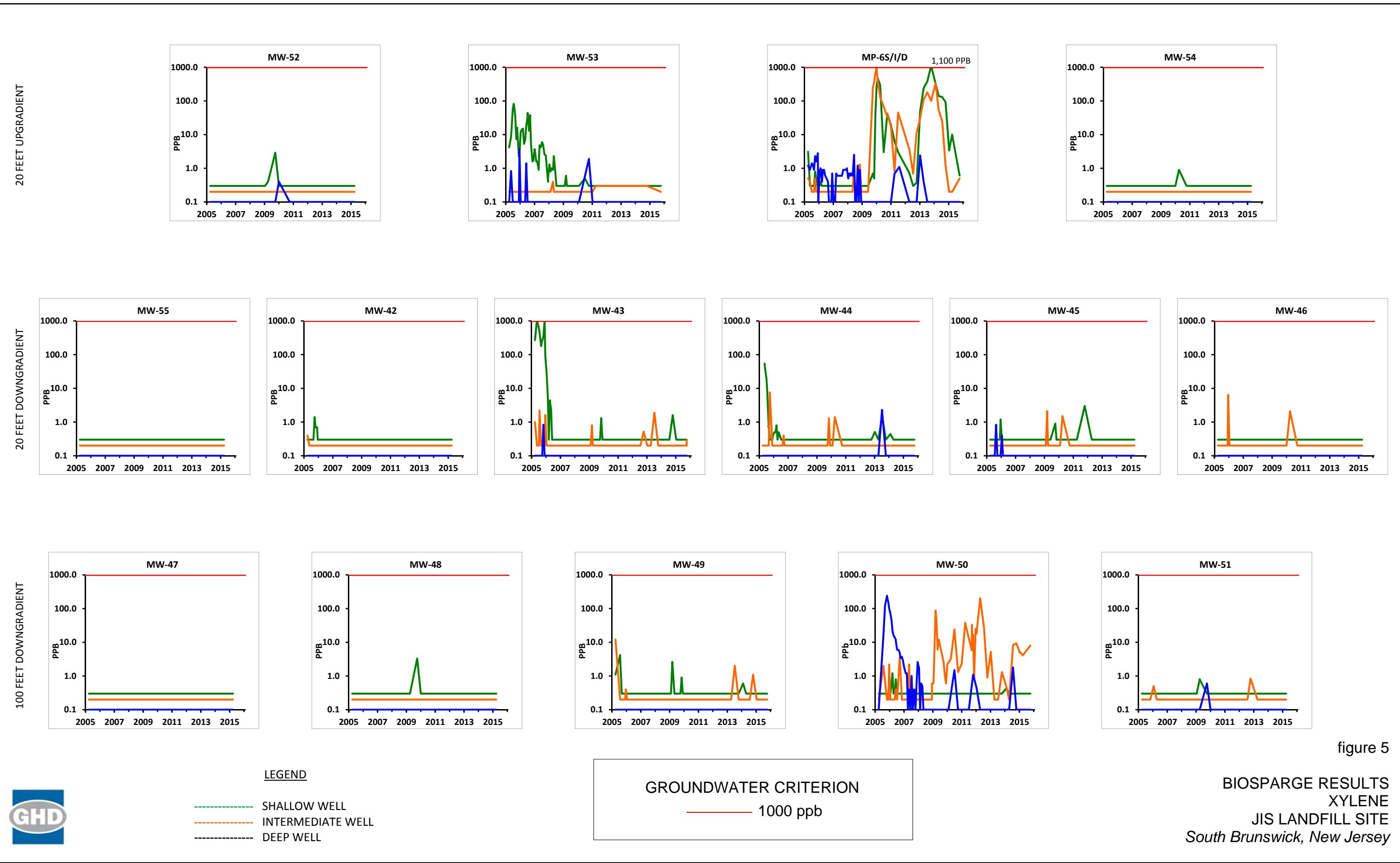
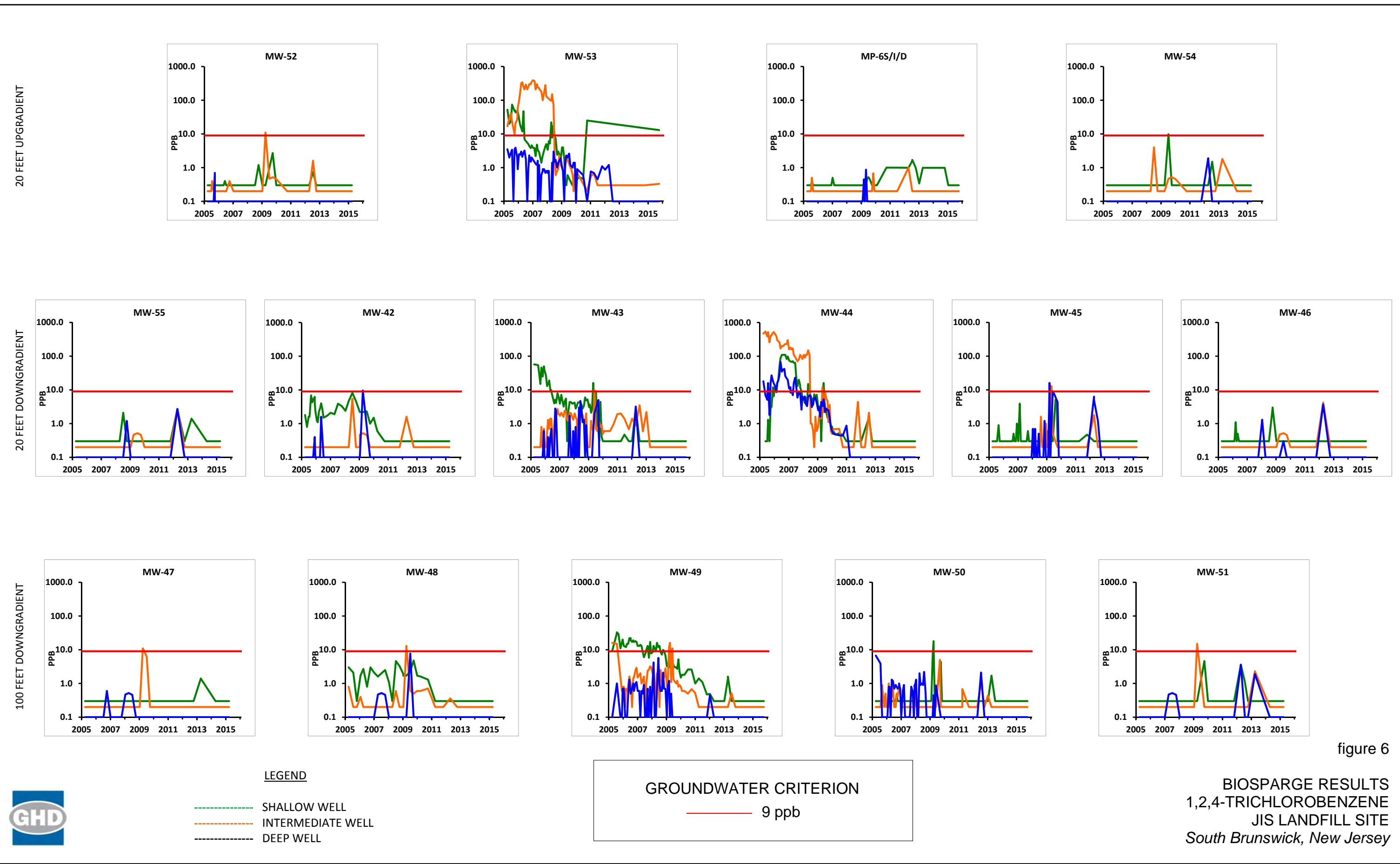


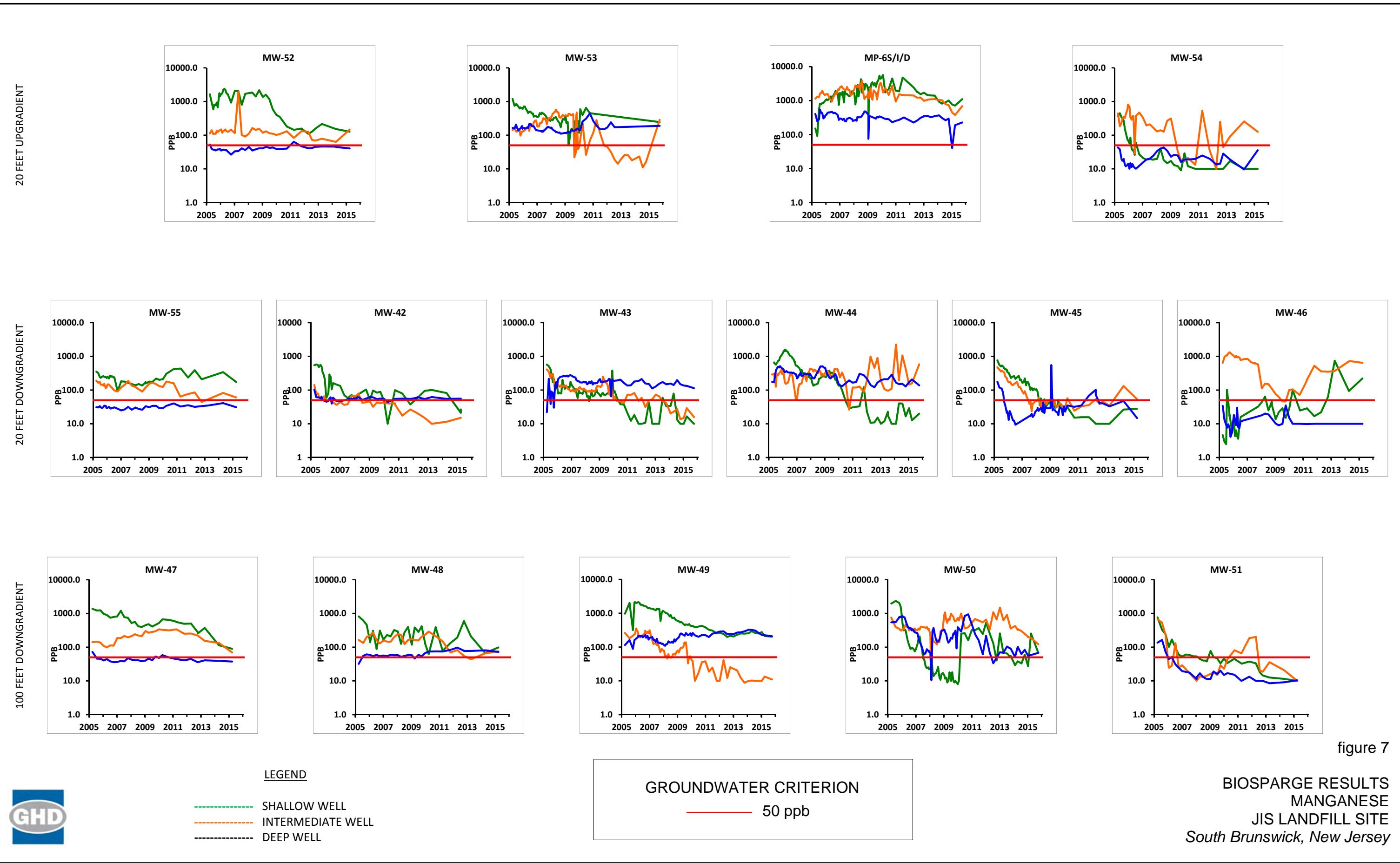
figure 3

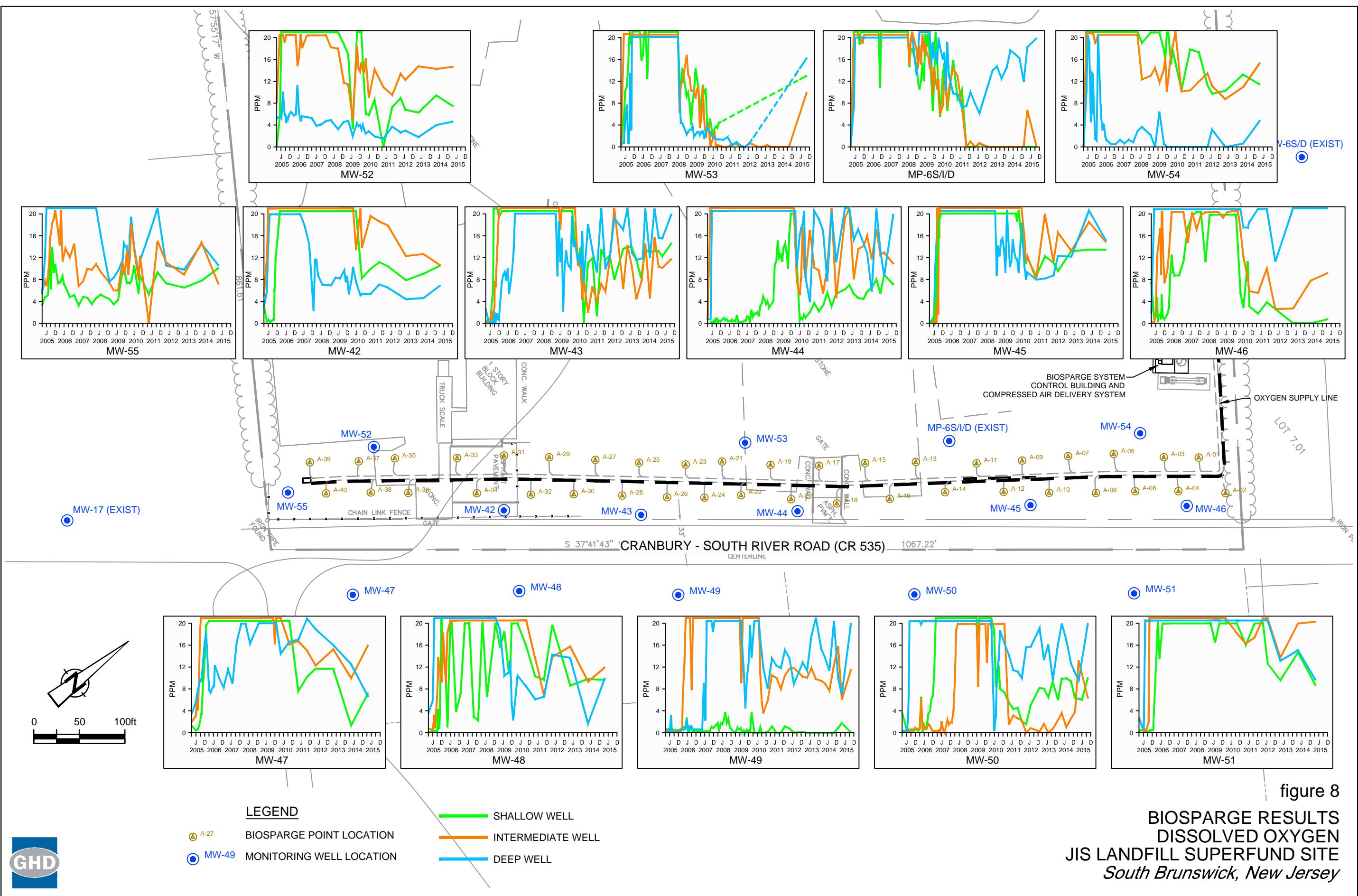












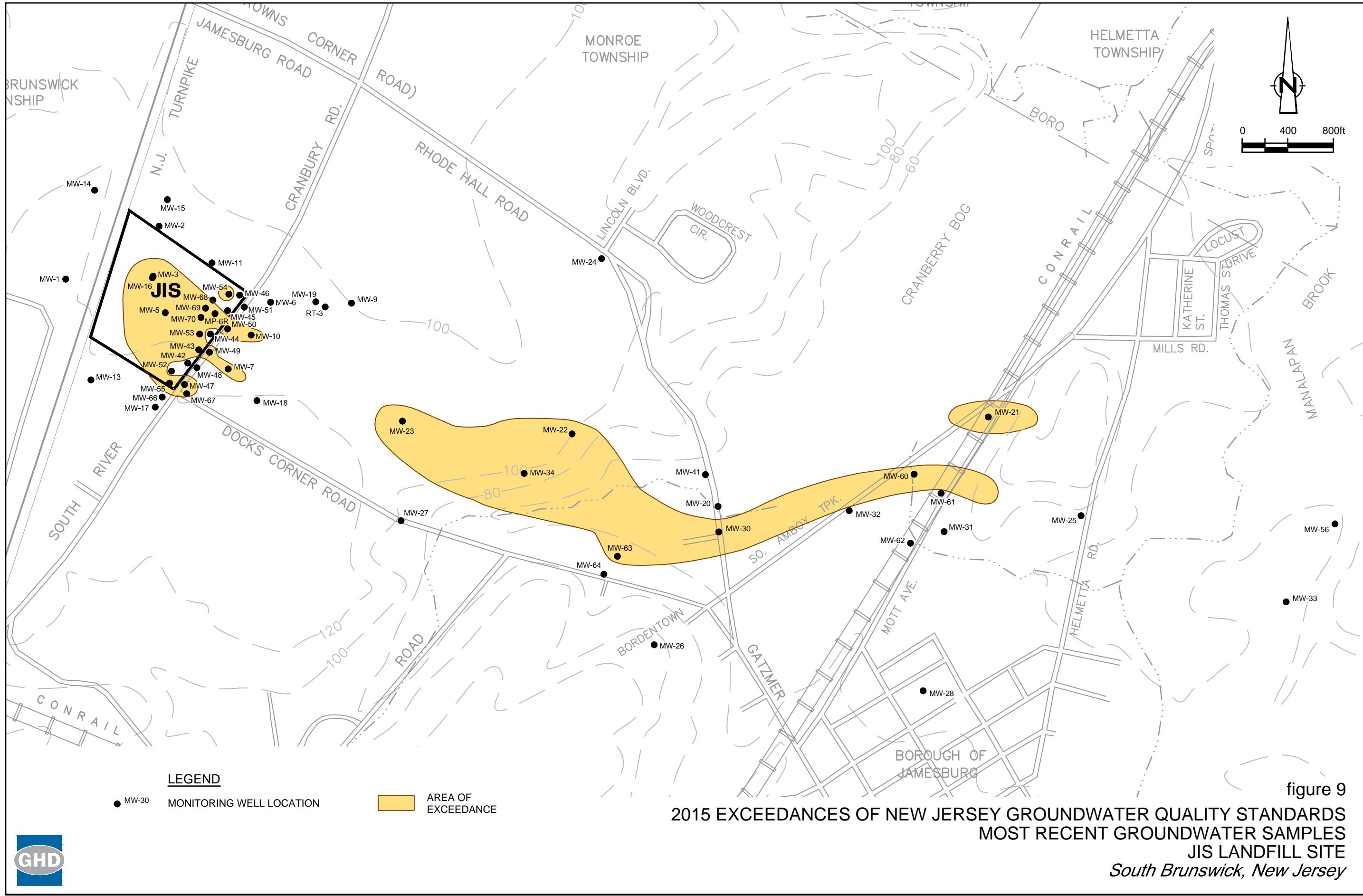
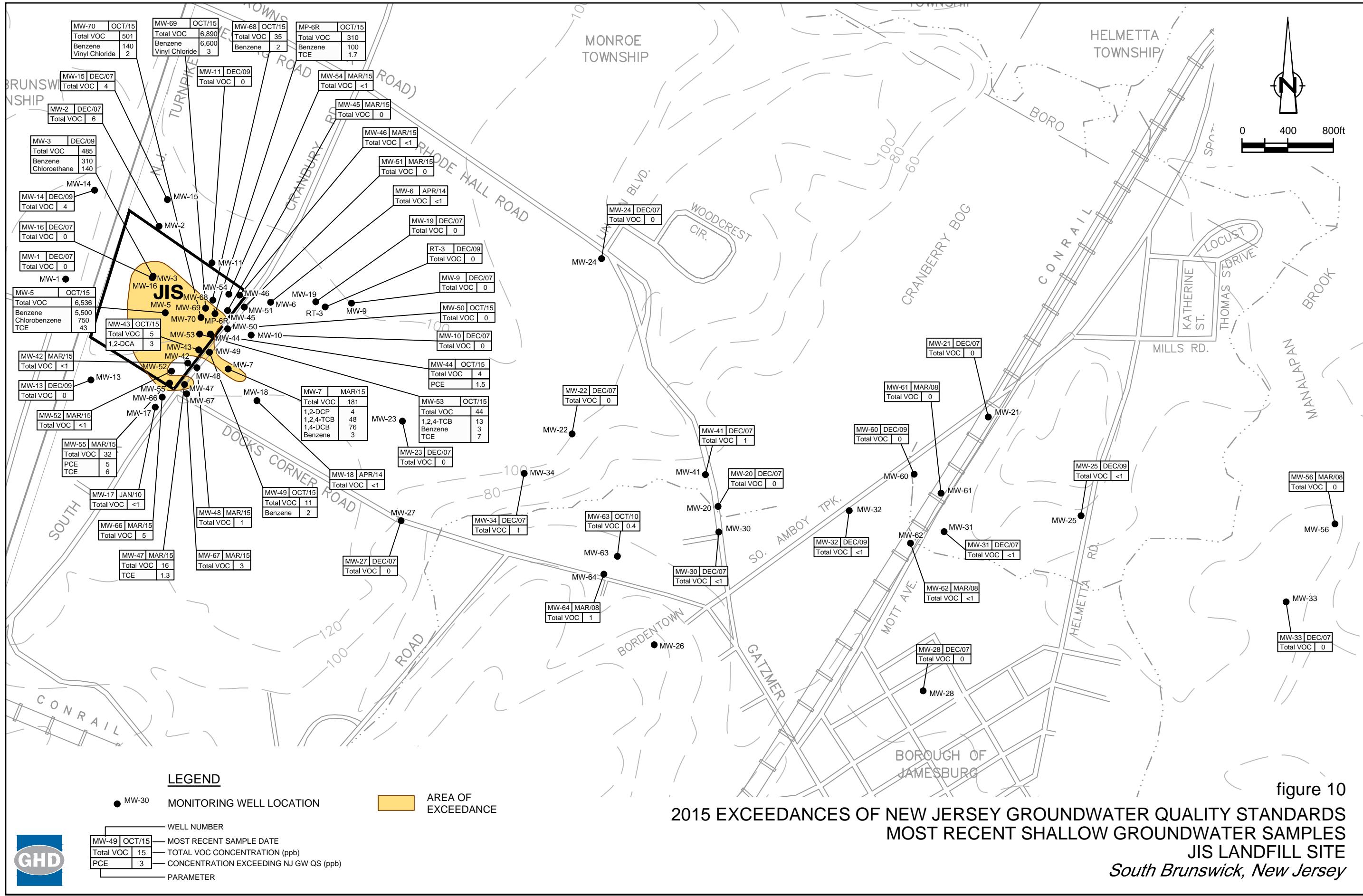


figure 9



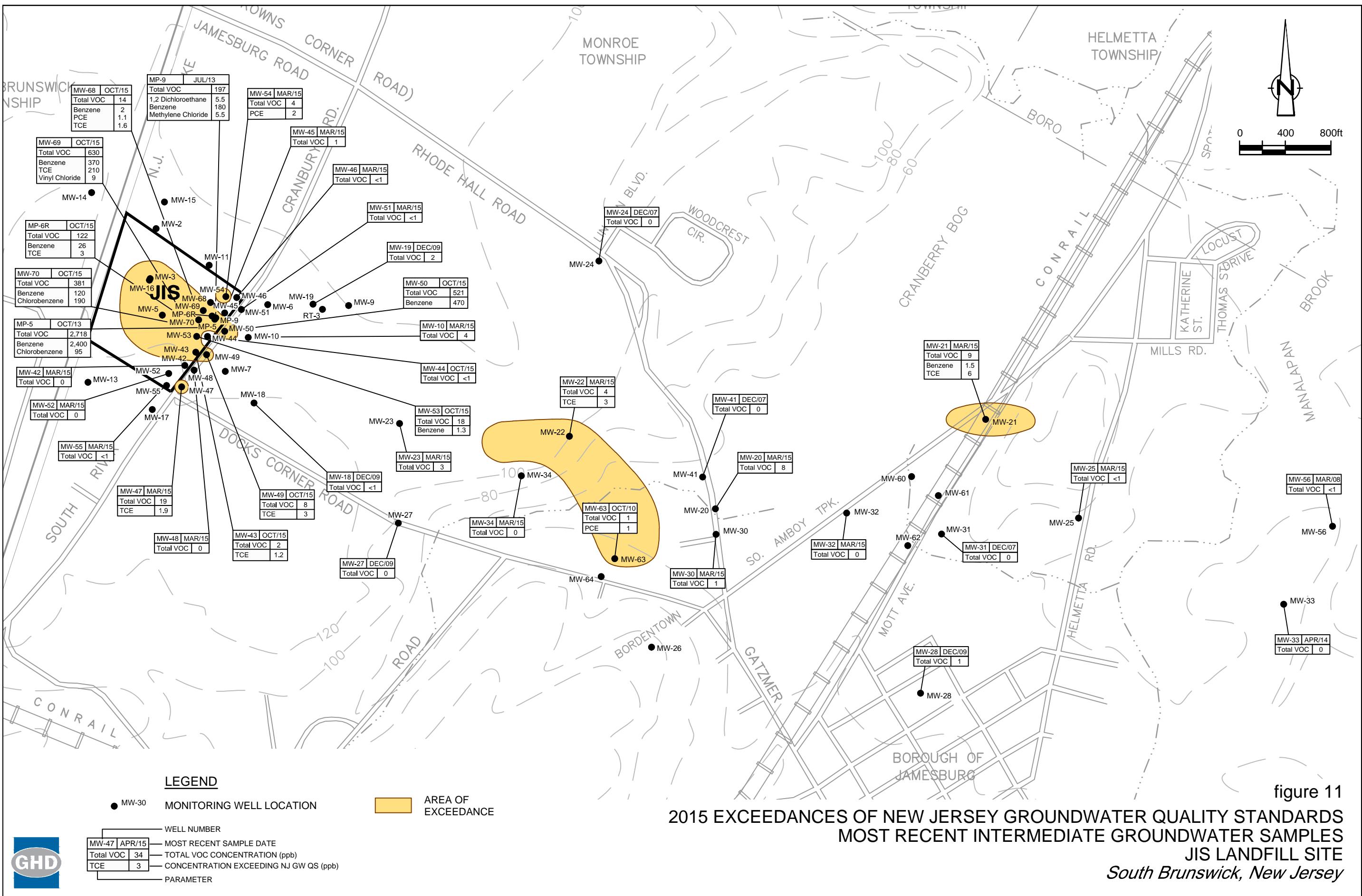


figure 11

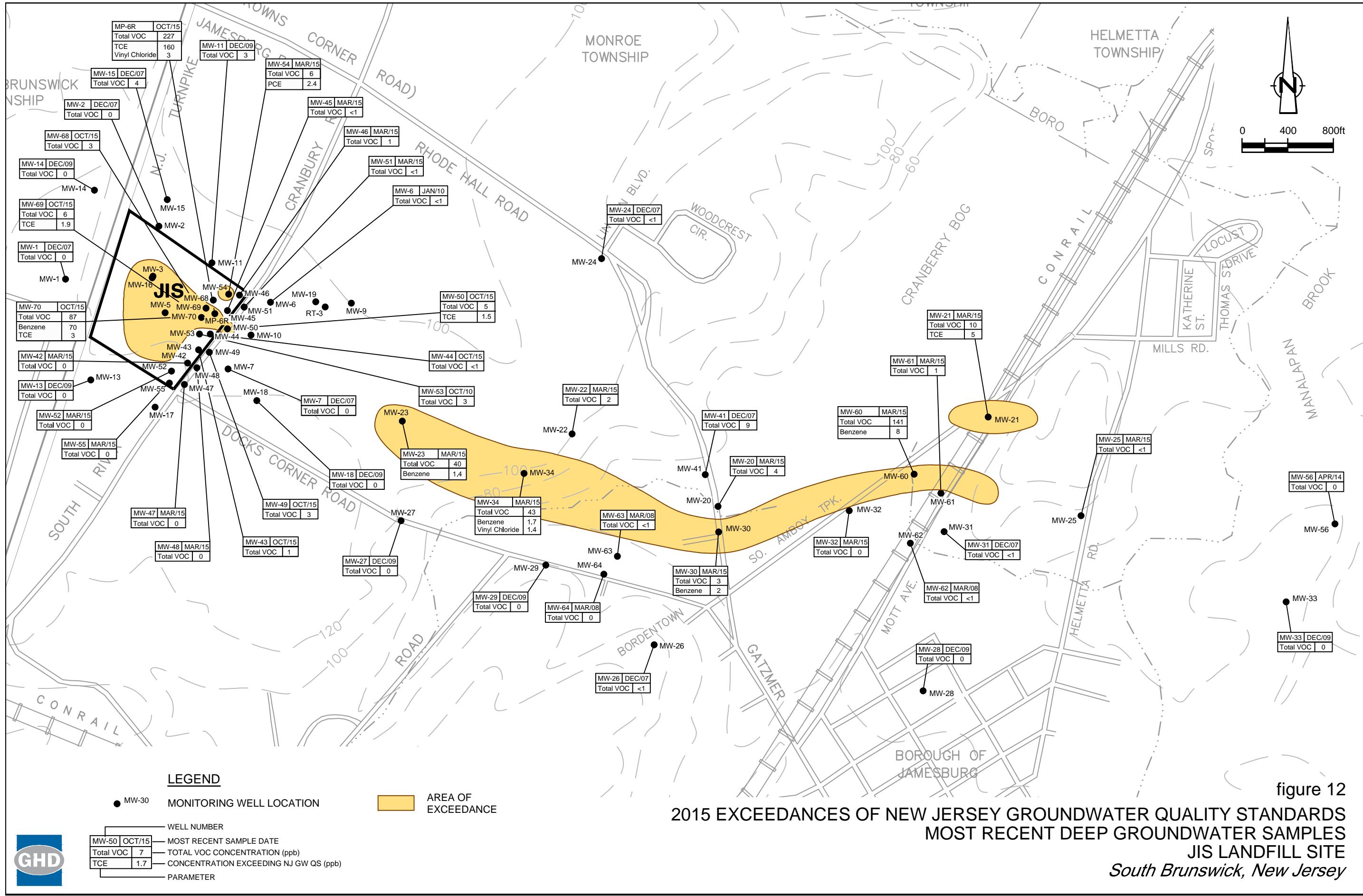
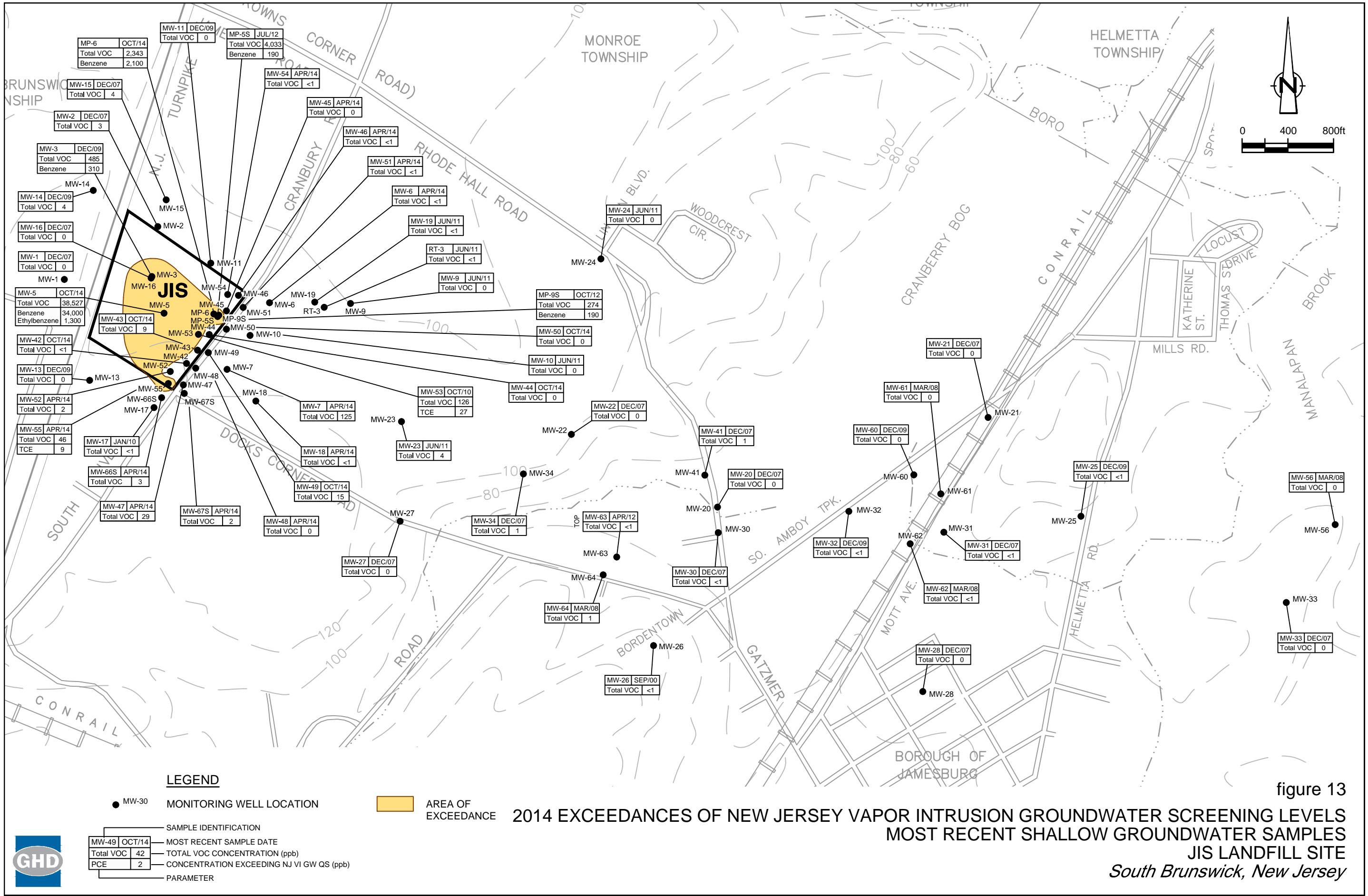


figure 12



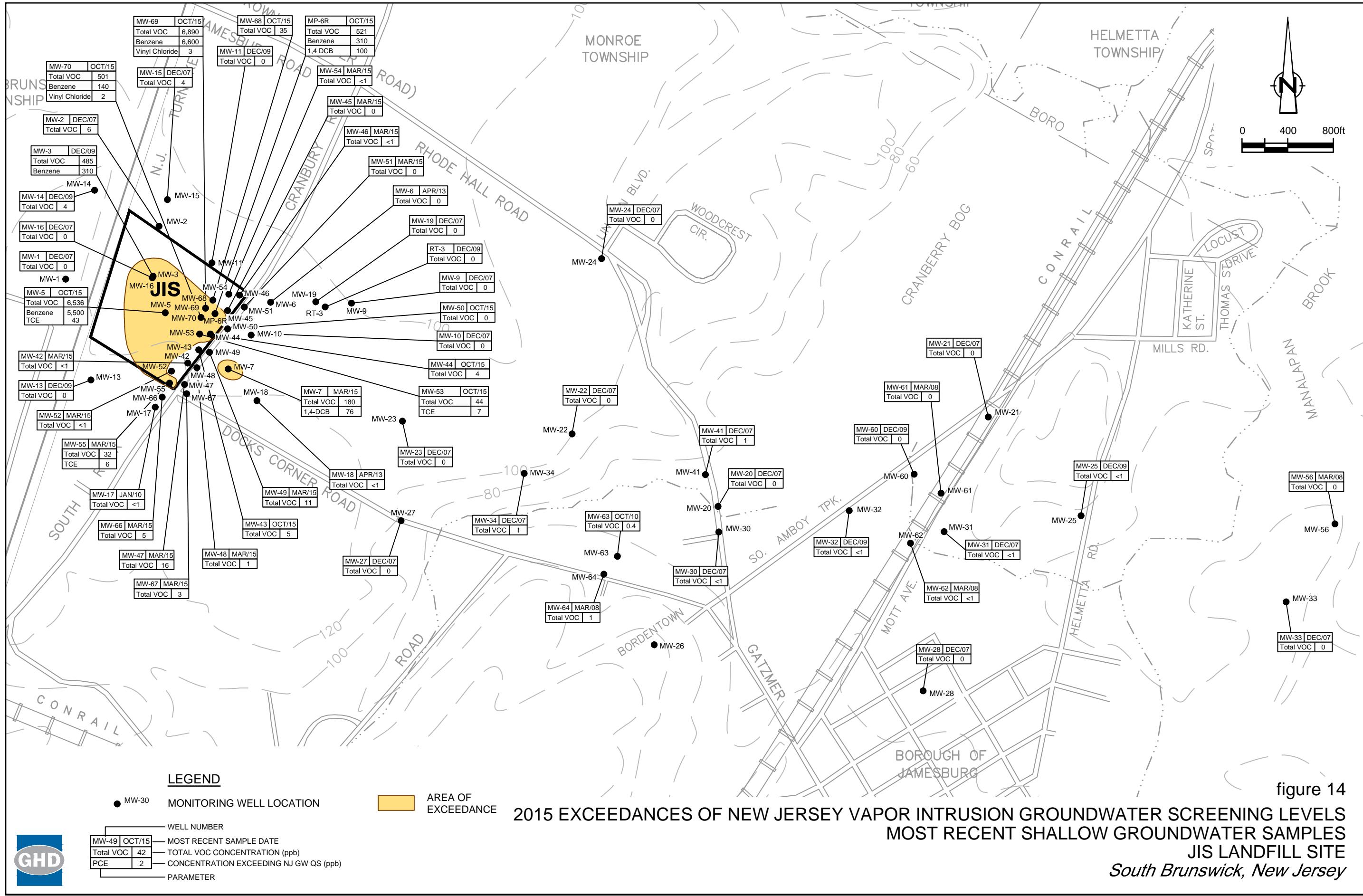
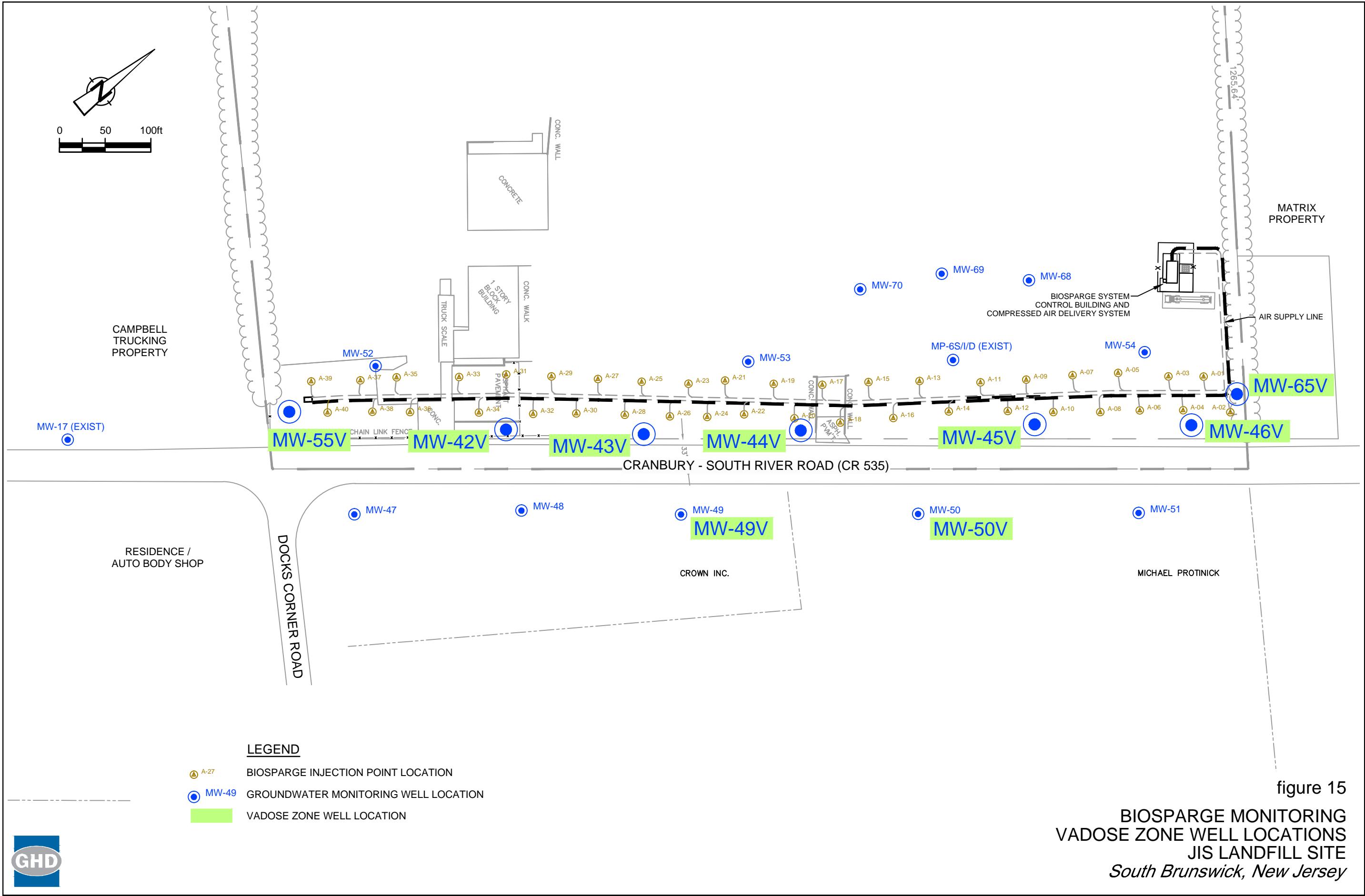
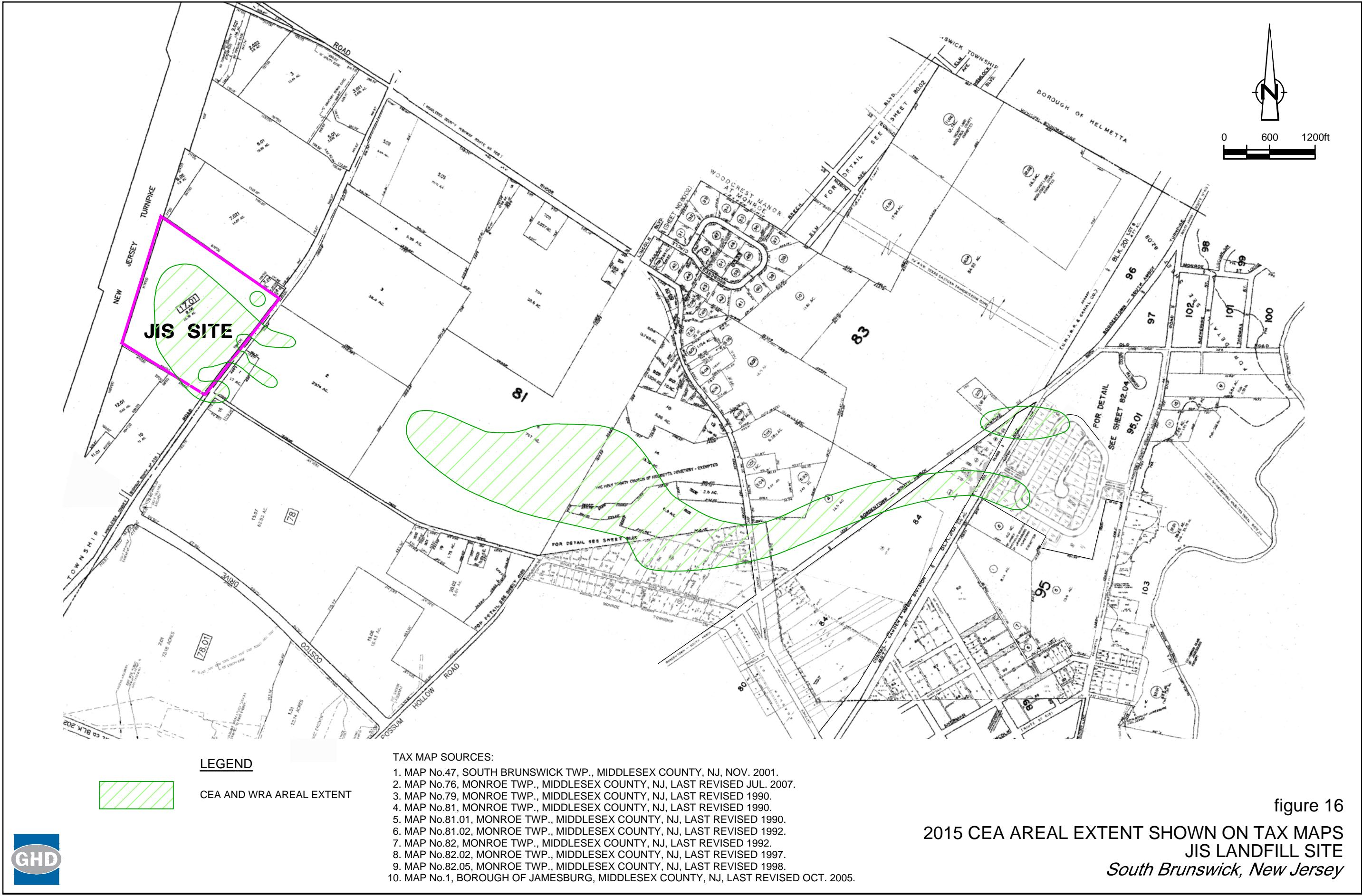


figure 14





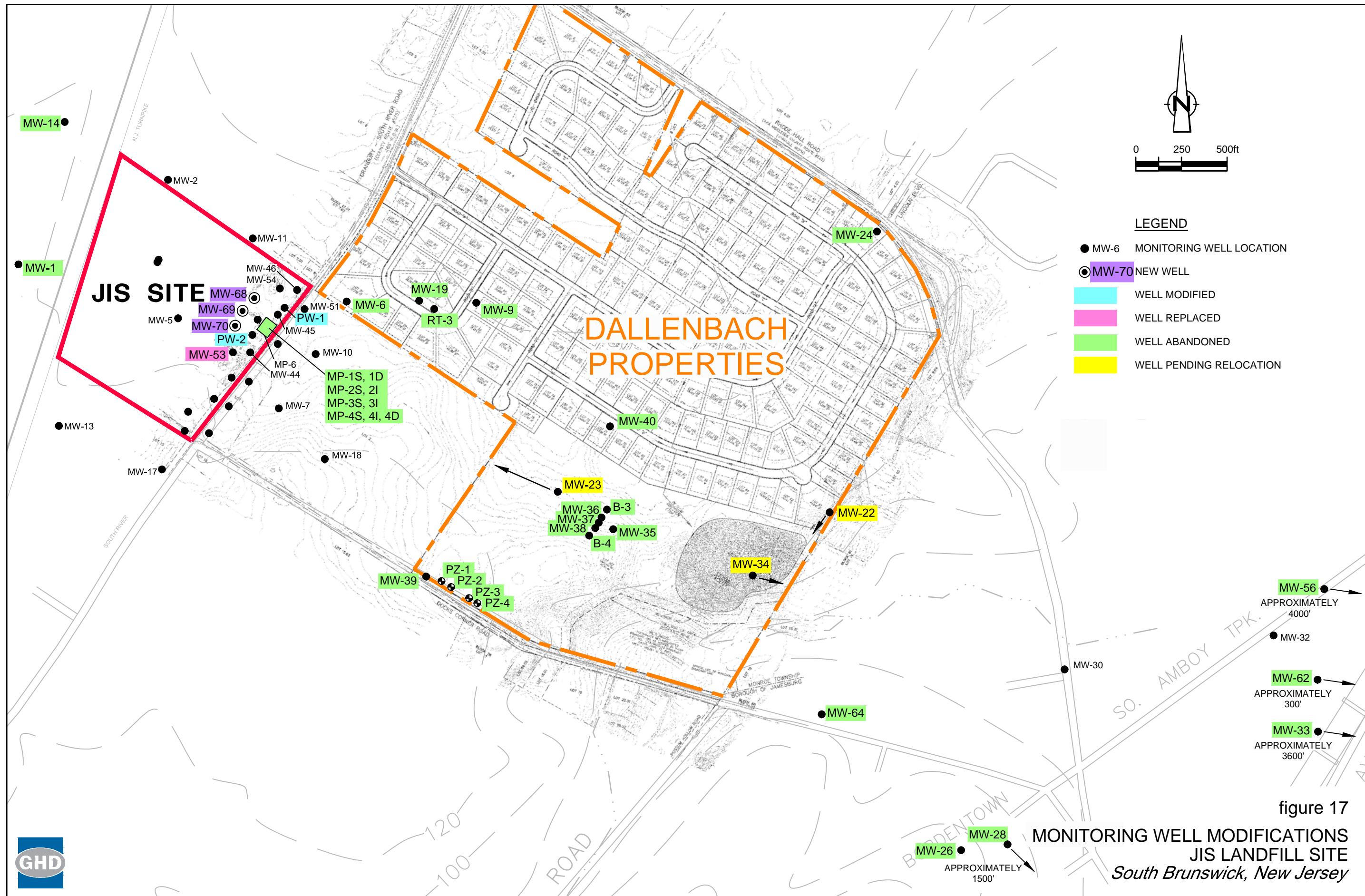


Table 1

Groundwater Analytical Results
NJGWQS Comparison
JIS Landfill Site

Sample Location: Sample Date:	PW-1-85 3/25/2015	PW-1-100 3/25/2015	PW-1I 10/9/2015	PW-1D 10/9/2015	PW-2-84 3/25/2015	PW-2-95 3/25/2015	PW-2-115 3/25/2015	PW-2I 10/9/2015	PW-2D 10/9/2015
Parameters	Units								
Volatiles									
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	0.33 J	0.35 J	0.48 J	1.0 U	0.57 J	0.56 J	1.0	0.65 J
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	0.46 J	1.0 UJ
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.31 J	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.31 J	0.31 J
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.58 J	0.46 J
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.22 J	2.9	0.47 J
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	0.42 J	1.0 U	2.1	1.9	7.4	1.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	1.1	1.0	1.2	0.96 J	1.0 U	1.0 U	1.0 U	0.41 J
Toluene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	0.23 J	1.0 U	3.7	4.0	16	0.86 J
Vinyl chloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.0 U
Xylenes (total)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	µg/L	1.43	1.35	2.33	0.96	6.37	6.68	29.36	3.28
Metals									
Arsenic	µg/L	-	-	2.2 J	2.5 U	-	-	-	8.5
Copper	µg/L	8.0 J	25.0 U	-	-	25.0 U	9.2 J	11.2 J	-
Iron	µg/L	2210	650	-	-	1730	2430	7640	-
Manganese	µg/L	-	-	78.1	13.4	-	-	-	502
Field Parameters									
Conductivity, field	umhos/cm	-	-	1090	1130	-	-	-	786
Dissolved oxygen (DO), field	mg/L	-	-	15.36	20 >	-	-	-	14.02
Ferrous iron	mg/L	-	-	2.2	0	-	-	-	0.2
Iron	mg/L	-	-	3.5	2.2	-	-	-	4.2
Oxidation reduction potential (ORP), field	millivolts	-	-	184	185	-	-	-	333
pH, field	s.u.	-	-	6.61	6.78	-	-	-	6.56
Temperature, field	deg C	-	-	17.0	16.1	-	-	-	16.1
Turbidity	NTU	-	-	430	460	-	-	-	999 >

Notes:

> - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

- - Not applicable.

Table 2

Page 1 of 1

Dissolved Oxygen Concentrations
JIS Landfill Site

Well #	April. 2014	July. 2014	Oct. 2014	Jan. 2015	Mar. 2015	Oct. 2014
	8th-25th	24th-25th	15th-17th	7th-8th	27th-31st	6th-10th
MW-5	0	0.00	0.00	0.00	3.42	0.04
MP6S-R	0.00	0.00	0.00	0.00	6.72	0.00
MP6I-R	0.00	0.00	0.00	0.00	0.11	0.11
MP6D	17.67	17.01	16.19	11.95	18.30	19.90
MW42S	9.04				10.55	
MW42I	12.65				10.48	
MW42D	4.59				6.92	
MW43S	13.30	12.98	13.11	13.21	12.22	14.66
MW43I	14.55	4.55	15.73	10.35	10.10	11.77
MW43D	>20	11.98	>20	15.65	15.50	>20
MW44S	5.76	6.44	7.99	5.46	8.88	7.05
MW44I	15.98	11.67	17.18	12.54	12.91	10.84
MW44D	12.80	5.41	>20	13.27	8.64	>20
MW45S	13.45				13.43	
MW45I	18.50				14.81	
MW45D	>20				15.09	
MW46S	0.00				0.71	
MW46I	7.80				9.18	
MW46D	>20				>20	
MW52S	9.45				7.43	
MW52I	14.28				14.67	
MW52D	4.01				4.63	
MW53S	blocked	blocked	blocked	blocked	blocked	13.03
MW53I	0.04	0.00	0.00	NS	blocked	9.97
MW53D	blocked	blocked	blocked	blocked	blocked	16.28
MW54S	13.24				11.40	
MW54I	10.95				15.40	
MW54D	0.63				4.87	
MW55S	7.77				10.10	
MW55I	14.75				7.10	
MW55D	14.5				10.51	
MW47S	1.33				7.26	
MW47I	9.96				16.03	
MW47D	12.51				6.57	
MW48S	9.82				9.64	
MW48I	9.32				11.97	
MW48D	1.65				9.98	
MW49S	0.00	0.00	0.00	0.86	1.76	0.00
MW49I	9.00	7.67	12.42	15.82	6.08	11.58
MW49D	13.8	11.31	>20	9.95	6.97	>20
MW50S	9.84	9.94	9.41	6.38	6.03	10.10
MW50I	3.60	0.98	2.56	3.78	13.20	6.25
MW50D	>20	17.11	12.72	10.97	9.60	>20
MW51S	14.67				8.65	
MW51I	>20				20.30	
MW51D	14.71				9.61	

Table 3

Shallow Groundwater Analytical Results
NJGWSL Comparison
JIS Landfill

Sample Location:	<i>NJDEP Generic Vapor Intrusion Groundwater</i>	JIS-6 3/25/2015	JIS-6 3/25/2015	MP-6SR 1/14/2015	MP-6SR 3/31/2015	MP-6SR 10/6/2015	MW-5 1/14/2015	MW-5 3/31/2015	MW-5 10/7/2015	MW-7S 3/26/2015	MW-42S 3/31/2015
Sample Date:			Parameters	Units	Screening Levels						
Volatiles											
1,1,1-Trichloroethane	µg/L	13000	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	6	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	8	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	50	0.39 J	0.39 J	0.49 J	0.60 J	20 U	1.0 U	5.0 U	0.73 J	1.0 U
1,1-Dichloroethene	µg/L	260	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	130	0.28 J	1.0 U	1.0 U	1.0 UJ	20 U	1.0 U	5.0 UJ	48	1.0 U
1,2-Dichlorobenzene	µg/L	6800	1.6	2.4	1.4	2.2	16 J	11	8.2	14	1.0 U
1,2-Dichloroethane	µg/L	3	0.64 J	0.49 J	0.59 J	0.82 J	20 U	1.0 U	5.0 U	1.3	0.33 J
1,2-Dichloropropane	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	3.6	1.0 U
1,3-Dichlorobenzene	µg/L	--	5.9	7.3	4.4	8.5	15 J	12	9.6	14	1.0 U
1,4-Dichlorobenzene	µg/L	75	56	78	44	100	82	33	22	76	1.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	900000	5.0 U	5.0 U	5.0 U	100 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	21000000	5.0 U	5.0 U	20	100 U	24	65	5.0 U	5.0 U	5.0 U
Benzene	µg/L	20	300	250	700	310	31000 J	6400	5500	2.8	1.0 U
Bromodichloromethane	µg/L	2	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Bromoform	µg/L	300	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	20	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	770	23	21	19	27	1000	700	750	16	1.0 U
Chloroethane	µg/L	26000	13	15	12	25	83	18	33	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	240	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	--	0.66 J	1.0 U	0.62 J	2.3	20 U	1.0 U	5.0 U	0.81 J	0.36 J
cis-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	16000	11	10	7.8	15	78	6.1	59	2.1	1.0 U
Dibromochloromethane	µg/L	6	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	700	0.85 J	0.74 J	4.1	0.33 J	570	46	6.2	1.0 U	1.0 U
Hexane	µg/L	160	2.9	2.9	1.3	3.2	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	920	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	31	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Toluene	µg/L	330000	1.4	0.77 J	1.8	1.1	13 J	3.7	2.3 J	0.30 J	1.0 U
trans-1,2-Dichloroethene	µg/L	520	2.7	2.1	2.2	2.9	20 U	1.0 U	5.0 U	0.43 J	1.0 U
trans-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	2	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	43	0.63 J	1.0 U
Vinyl chloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	20 U	1.0 U	5.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	8600	2.7	3.4	10	0.61 J	2300	410	38	2.0 U	2.0 U
Total VOCs	µg/L	--	423.02	394.49	809.7	521.26	35157	7663.8	6536.3	180.7	0.69

Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

Criteria Notes:

* - Criteria value for 1,3-Dichloropropene used.

-- Not applicable.

Table 3

Shallow Groundwater Analytical Results
NJGWSL Comparison
JIS Landfill

Sample Location: Sample Date:	MW-42S 3/31/2015 Duplicate	MW-43S 1/13/2015	MW-43S 3/31/2015	MW-43S 10/6/2015	MW-44S 1/13/2015	MW-44S 3/31/2015	MW-44S 10/6/2015	MW-45S 3/27/2015	MW-46S 3/30/2015	MW-47S 3/27/2015
Parameters	Units									
Volatiles										
1,1,1-Trichloroethane										
1,1,2,2-Tetrachloroethane	µg/L	1.0 U								
1,1,2-Trichloroethane	µg/L	1.0 U								
1,1-Dichloroethane	µg/L	1.0 U	0.37 J	1.0 U						
1,1-Dichloroethene	µg/L	1.0 U								
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	0.27 J	1.0 U	1.0 U	0.98 J	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.37 J	2.8	2.0	3.0	1.0 U				
1,2-Dichloropropane	µg/L	0.53 J	1.2	1.1	0.88 J	1.0 U				
1,3-Dichlorobenzene	µg/L	1.0 U								
1,4-Dichlorobenzene	µg/L	1.0 U	0.82 J	1.0 U	1.0 U	1.0 U	1.0 U	1.6	1.0 U	1.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U								
Acetone	µg/L	5.0 U								
Benzene	µg/L	1.0 U	1.4	1.0 U						
Bromodichloromethane	µg/L	1.0 U								
Bromoform	µg/L	1.0 U								
Bromomethane (Methyl bromide)	µg/L	1.0 U								
Carbon tetrachloride	µg/L	1.0 U								
Chlorobenzene	µg/L	1.0 U								
Chloroethane	µg/L	1.0 U								
Chloroform (Trichloromethane)	µg/L	1.0 U								
Chloromethane (Methyl chloride)	µg/L	1.0 U								
cis-1,2-Dichloroethene	µg/L	1.0 U	14							
cis-1,3-Dichloropropene	µg/L	1.0 U								
Cyclohexane	µg/L	1.0 U								
Dibromochloromethane	µg/L	1.0 U								
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U								
Ethylbenzene	µg/L	1.0 U								
Hexane	µg/L	1.0 U								
Methylene chloride	µg/L	1.0 U								
Tetrachloroethene	µg/L	1.0 U	1.5	1.0 U	0.48 J					
Toluene	µg/L	1.0 U								
trans-1,2-Dichloroethene	µg/L	1.0 U	0.22 J	1.0 U	0.22 J	1.0 U				
trans-1,3-Dichloropropene	µg/L	1.0 U								
Trichloroethene	µg/L	1.0 U	0.37 J	0.35 J	0.26 J	1.0 U	1.0 U	1.0 U	1.0 U	0.40 J
Vinyl chloride	µg/L	1.0 U								
Xylenes (total)	µg/L	2.0 U								
Total VOCs	µg/L	0.9	7.18	3.45	4.63	ND	ND	4.08	ND	0.4
										15.78

Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

Criteria Notes:

* - Criteria value for 1,3-Dichloropropene used.

-- Not applicable.

Table 3

Shallow Groundwater Analytical Results
NJGWSL Comparison
JIS Landfill

Sample Location: Sample Date:	MW-48S 3/27/2015	MW-49S 1/13/2015	MW-49S 3/27/2015	MW-49S 10/6/2015	MW-50S 1/13/2015	MW-50S 3/30/2015	MW-50S 10/7/2015	MW-51S 3/30/2015	MW-51S 3/30/2015	MW-52S 3/30/2015
Parameters	Units								Duplicate	
Volatiles										
1,1,1-Trichloroethane	µg/L	1.0 U								
1,1,2,2-Tetrachloroethane	µg/L	1.0 U								
1,1,2-Trichloroethane	µg/L	1.0 U								
1,1-Dichloroethane	µg/L	1.0 U								
1,1-Dichloroethene	µg/L	1.0 U								
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	0.68 J	0.49 J	0.66 J	1.0 U				
1,2-Dichloroethane	µg/L	0.33 J	0.20 J	0.30 J	0.39 J	1.0 U				
1,2-Dichloropropane	µg/L	0.63 J	0.10 J	1.0 U						
1,3-Dichlorobenzene	µg/L	1.0 U	0.24 J	1.0 U	0.34 J	1.0 U				
1,4-Dichlorobenzene	µg/L	1.0 U	3.1 J	2.4	4.2	1.0 U				
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U								
Acetone	µg/L	5.0 U								
Benzene	µg/L	1.0 U	2.2 J	1.9	1.9	1.0 U				
Bromodichloromethane	µg/L	1.0 U								
Bromoform	µg/L	1.0 U								
Bromomethane (Methyl bromide)	µg/L	1.0 U								
Carbon tetrachloride	µg/L	1.0 U								
Chlorobenzene	µg/L	1.0 U	0.55 J	0.44 J	0.75 J	1.0 U				
Chloroethane	µg/L	1.0 U								
Chloroform (Trichloromethane)	µg/L	1.0 U								
Chloromethane (Methyl chloride)	µg/L	1.0 U								
cis-1,2-Dichloroethene	µg/L	0.27 J	1.3 J	0.98 J	0.93 J	1.0 U	1.0 U	1.0 U	1.0 U	0.88 J
cis-1,3-Dichloropropene	µg/L	1.0 U								
Cyclohexane	µg/L	1.0 U	0.57 J	1.0 U	0.92 J	1.0 U				
Dibromochloromethane	µg/L	1.0 U								
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U								
Ethylbenzene	µg/L	1.0 U								
Hexane	µg/L	1.0 U								
Methylene chloride	µg/L	1.0 U								
Tetrachloroethene	µg/L	1.0 U								
Toluene	µg/L	1.0 U								
trans-1,2-Dichloroethene	µg/L	1.0 U	0.22 J	1.0 U	0.25 J	1.0 U				
trans-1,3-Dichloropropene	µg/L	1.0 U								
Trichloroethene	µg/L	1.0 U	0.52 J	0.54 J	0.49 J	1.0 U				
Vinyl chloride	µg/L	1.0 U	0.61 J	0.44 J	0.64 J	1.0 U				
Xylenes (total)	µg/L	2.0 U								
Total VOCs	µg/L	1.23	10.29	7.49	11.47	ND	ND	ND	ND	0.88

Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

Criteria Notes:

* - Criteria value for 1,3-Dichloropropene used.

-- Not applicable.

Table 3

Shallow Groundwater Analytical Results
NJGWSL Comparison
JIS Landfill

Sample Location: Sample Date:	MW-53SR 10/8/2015	MW-54S 3/30/2015	MW-55S 3/30/2015	MW-66S 3/25/2015	MW-67S 3/30/2015	MW-68S 5/21/2015	MW-68S 10/8/2015	MW-69S 5/22/2015	MW-69S 5/22/2015 Duplicate	MW-69S 10/8/2015
Parameters	Units									
Volatiles										
1,1,1-Trichloroethane	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
1,1,2,2-Tetrachloroethane	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
1,1,2-Trichloroethane	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
1,1-Dichloroethane	µg/L	1.0 U	0.67 J	0.60 J	5.0 U	1.6 J				
1,1-Dichloroethene	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
1,2,4-Trichlorobenzene	µg/L	13 J	1.0 U	5.0 U	5.0 U	5.0 UJ				
1,2-Dichlorobenzene	µg/L	0.67 J	1.0 U	0.38 J	1.9 J	2.0 J				
1,2-Dichloroethane	µg/L	0.28 J	1.0 U	1.0 U	1.0 U	1.0 U	0.30 J	0.36 J	5.0 U	5.0 U
1,2-Dichloropropane	µg/L	1.0 U	5.0 U	1.0 J						
1,3-Dichlorobenzene	µg/L	2.7	1.0 U	1.0 U	1.0 U	1.0 U	0.90 J	1.4	4.0 J	4.1 J
1,4-Dichlorobenzene	µg/L	7.3	1.0 U	1.0 U	1.0 U	1.0 U	2.6	4.3	32	32
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	25 U	25 U	25 U					
Acetone	µg/L	5.0 U	25 U	25 U	25 U					
Benzene	µg/L	3.0	1.0 U	1.0 U	1.0 U	1.0 U	20	2.3	8100	8300
Bromodichloromethane	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Bromoform	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Bromomethane (Methyl bromide)	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Carbon tetrachloride	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Chlorobenzene	µg/L	5.1	1.0 U	0.34 J	1.0 U	1.0 U	9.9	7.5	30	30
Chloroethane	µg/L	1.2	1.0 U	1.0 U	1.0 U	1.0 U	23	13	26	29
Chloroform (Trichloromethane)	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Chloromethane (Methyl chloride)	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
cis-1,2-Dichloroethene	µg/L	2.7	1.0 U	21	2.6	1.2	0.53 J	1.0 U	5.0 U	5.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Cyclohexane	µg/L	1.0 U	3.4	2.3	10	11				
Dibromochloromethane	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	5.0 U	5.0 U	5.0 U					
Ethylbenzene	µg/L	1.0 U	35	37						
Hexane	µg/L	1.0 U	2.5	2.3	5.0 U	5.0 U				
Methylene chloride	µg/L	1.0 U	0.64 J	1.0 U	5.0 U	5.0 U				
Tetrachloroethene	µg/L	1.0 U	0.45 J	4.5	1.0	0.98 J	1.0 U	1.0 U	5.0 U	5.0 U
Toluene	µg/L	1.0 U	0.56 J	0.28 J	2.7 J	2.6 J				
trans-1,2-Dichloroethene	µg/L	0.44 J	1.0 U	1.0 U	1.0 U	1.0 U	0.87 J	0.75 J	2.1 J	2.1 J
trans-1,3-Dichloropropene	µg/L	1.0 U	5.0 U	5.0 U						
Trichloroethene	µg/L	6.9	1.0 U	5.8	1.0	0.60 J	1.0 U	1.0 U	5.0 U	5.0 U
Vinyl chloride	µg/L	0.21 J	1.0 U	1.0 U	1.0 U	1.0 U	0.51 J	1.0 U	5.0 U	5.0 U
Xylenes (total)	µg/L	2.0 U	95	84						
Total VOCs	µg/L	43.5	0.45	31.64	4.6	2.78	66.38	35.47	8338.7	8546.8
										6890

Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

Criteria Notes:

* - Criteria value for 1,3-Dichloropropene used.

-- Not applicable.

Table 3

Shallow Groundwater Analytical Results
NJGWSL Comparison
JIS Landfill

Sample Location:	MW-70S 5/22/2015	MW-70S 10/8/2015	PW-1-72 3/25/2015	PW-2-84 3/25/2015
Parameters	Units			
Volatiles				
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	1.6	5.9	0.30 J
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	2.5	0.78 J	1.0 U
1,2-Dichlorobenzene	µg/L	1.5	0.80 J	1.0 U
1,2-Dichloroethane	µg/L	0.52 J	1.1	1.0 U
1,2-Dichloropropane	µg/L	0.33 J	0.93 J	1.0 U
1,3-Dichlorobenzene	µg/L	4.8	1.8	1.0 U
1,4-Dichlorobenzene	µg/L	37	12	1.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	5.0 U	5.0 U
Acetone	µg/L	5.0 U	5.0 U	5.0 U
Benzene	µg/L	160	140	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	40	14	1.0 U
Chloroethane	µg/L	140	300	1.0 U
Chloroform (Trichloromethane)	µg/L	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	0.28 J	2.4	1.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	8.6	12	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	0.78 J	1.0 U
Hexane	µg/L	3.7	3.2	1.0 U
Methylene chloride	µg/L	1.0	1.3	1.0 U
Tetrachloroethene	µg/L	1.0 U	1.0 U	1.0 U
Toluene	µg/L	0.74 J	0.80 J	1.0 U
trans-1,2-Dichloroethene	µg/L	0.66 J	0.70 J	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	1.0 U	2.4	1.0 U
Xylenes (total)	µg/L	2.0 U	2.0 U	2.0 U
Total VOCs	µg/L	403.23	500.89	1.4
				6.37

Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

Criteria Notes:

* - Criteria value for 1,3-Dichloropropene used.

-- Not applicable.

Table 4

Page 1 of 1

Vadose Zone Field Sampling Results
JIS Landfill Site

Well #	17-Oct-14					23-Apr-15					7-Oct-15				
	PID in Well (ppm)	PID @ Ground level	O2 (%)	CO2 (%)	CH4 (%)	PID in Well (ppm)	PID @ Ground level	O2 (%)	CO2 (%)	CH4 (%)	PID in Well (ppm)	PID @ Ground level	O2 (%)	CO2 (%)	CH4 (%)
MW55V	0.00	0.00	18.40	3.20	0.00	0.00	0.00	19.50	3.70	0.00	0.00	0.00	19.30	3.10	0.00
MW42V	0.00	0.00	19.60	0.70	0.00	0.00	0.00	19.90	0.60	0.00	0.00	0.00	19.50	0.80	0.00
MW43V	0.00	0.00	19.00	0.70	0.00	0.00	0.00	19.60	0.80	0.00	0.00	0.00	19.50	0.80	0.00
MW44V	0.00	0.00	19.00	4.00	0.00	0.00	0.00	18.60	2.70	0.00	0.00	0.00	18.40	2.50	0.00
MW45V	0.00	0.00	18.30	2.50	0.00	0.00	0.00	19.70	2.20	0.00	0.00	0.00	19.70	2.10	0.00
MW46V	0.00	0.00	19.00	0.50	0.00	0.00	0.00	20.60	1.20	0.00	0.00	0.00	20.20	1.40	0.00
MW49V	0.00	0.00	19.20	1.10	0.00	0.00	0.00	20.20	0.50	0.00	0.00	0.00	19.90	0.70	0.00
MW50V	0.00	0.00	18.10	3.80	0.00	0.00	0.00	18.80	3.00	0.00	0.00	0.00	18.20	3.90	0.00
MW65V	0.00	0.00	18.90	2.90	0.00	0.00	0.00	19.10	3.10	0.00	0.00	0.00	19.20	3.00	0.00
MW66V		Buried						Buried	could not	locate			Buried	could not	locate
MW67V	0.00	0.00	20.10	0.20	0.00	0.00	0.00	19.90	1.70	0.00	0.00	0.00	19.70	1.80	0.00

Table 5

Page 1 of 2

Analytical Results Summary
Air Sampling
JIS Landfill Site
February 2015

Sample Location:		JIS Office	Outside Ambient
Sample Date:		2/27/2015	2/27/2015
Parameters	Units	<i>NJ Non-Residential Indoor Air Screening Level</i>	
Volatiles			
1,1,1-Trichloroethane	µg/m ³	22000	1 U
1,1,2,2-Tetrachloroethane	µg/m ³	3	1 U
1,1,2-Trichloroethane	µg/m ³	3	1 U
1,1-Dichloroethane	µg/m ³	8	0.8 U
1,1-Dichloroethene	µg/m ³	880	0.8 U
1,2,4-Trichlorobenzene	µg/m ³	9	4 U
1,2,4-Trimethylbenzene	µg/m ³	--	1
1,2-Dibromoethane (Ethylene dibromide)	µg/m ³	4	2 U
1,2-Dichlorobenzene	µg/m ³	880	1 U
1,2-Dichloroethane	µg/m ³	2	0.8 U
1,2-Dichloropropane	µg/m ³	2	0.9 U
1,2-Dichlortetrafluoroethane (CFC 114)	µg/m ³	--	1 U
1,3,5-Trimethylbenzene	µg/m ³	--	1 U
1,3-Butadiene	µg/m ³	1	0.4 U
1,3-Dichlorobenzene	µg/m ³	--	1 U
1,4-Dichlorobenzene	µg/m ³	3	1 U
1,4-Dioxane	µg/m ³	--	18 U
2,2,4-Trimethylpentane	µg/m ³	--	1
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m ³	22000	3
2-Chlorotoluene	µg/m ³	--	1 U
4-Ethyl toluene	µg/m ³	--	1 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m ³	13000	2 U
Acetone	µg/m ³	140000	19
Allyl chloride	µg/m ³	2	2 U
Benzene	µg/m ³	2	1
Bromodichloromethane	µg/m ³	3	1 U
Bromoform	µg/m ³	11	2 U
Bromomethane (Methyl bromide)	µg/m ³	22	0.8 U
Carbon disulfide	µg/m ³	3100	2 U
Carbon tetrachloride	µg/m ³	3	1 U
Chlorobenzene	µg/m ³	220	0.9 U
Chloroethane	µg/m ³	44000	1 U
Chloroform (Trichloromethane)	µg/m ³	2	1 U
Chloromethane (Methyl chloride)	µg/m ³	390	2
cis-1,2-Dichloroethene	µg/m ³	--	0.8 U
cis-1,3-Dichloropropene	µg/m ³	3*	0.9 U
Cyclohexane	µg/m ³	26000	0.8
Dibromochloromethane	µg/m ³	4	2 U
Dichlorodifluoromethane (CFC-12)	µg/m ³	440	3
Ethanol	µg/m ³	--	55
Ethylbenzene	µg/m ³	5	0.9 U
Hexachlorobutadiene	µg/m ³	5	2 U
Hexane	µg/m ³	3100	2
Isopropyl alcohol	µg/m ³	--	12 U
m&p-Xylenes	µg/m ³	440	3
Methyl methacrylate	µg/m ³	--	2 U
Methyl tert butyl ether (MTBE)	µg/m ³	47	0.7 U
Methylene chloride	µg/m ³	1200	6
N-Heptane	µg/m ³	--	0.8 U
o-Xylene	µg/m ³	440	0.9
Styrene	µg/m ³	4400	0.9 U
tert-Butyl alcohol	µg/m ³	--	15 U
Tetrachloroethene	µg/m ³	47	1 U
Tetrahydrofuran	µg/m ³	--	15 U
Toluene	µg/m ³	22000	4
trans-1,2-Dichloroethene	µg/m ³	260	0.8 U
trans-1,3-Dichloropropene	µg/m ³	3*	0.9 U
Trichloroethene	µg/m ³	3	1 U

Table 5

Page 2 of 2

Analytical Results Summary
Air Sampling
JIS Landfill Site
February 2015

Sample Location:		JIS Office	Outside Ambient
Sample Date:		2/27/2015	2/27/2015
Parameters		<i>NJ Non-Residential Indoor Air Screening Level</i>	
	Units		
Trichlorofluoromethane (CFC-11)	µg/m ³	3100	1
Trifluorotrichloroethane (CFC-113)	µg/m ³	130000	2 U
Vinyl bromide (Bromoethene)	µg/m ³	2	0.9 U
Vinyl chloride	µg/m ³	3	0.5 U

Notes:

U - Not detected at the associated reporting limit.

Criteria Notes:

* - Criteria value for 1,3-Dichloropropene used for comparison.

-- Not applicable.

Appendices

Appendix A

Photographs of Grass Fire Area



Photographs of Grass Fire Area Appendix A

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